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SUCCESSFUL FARMING.

from the Diary of
an Amateur Farmer

SUCCESSFUL FARMING.

SUCCESSFUL FARMING;

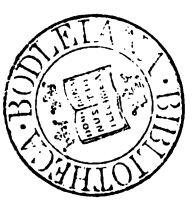
ITS ESSENTIALS, &c.

FROM THE

DIARY OF AN AMATEUR FARMER.

BY THE

REV. W. HOLT BEEVER, M.A., Oxon.



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PREFACE.

THIS little work is in the main a reprint of "Odds and Ends," an Appendix attached to "Notes on Fields and Cattle" in its first Edition, and which was favourably designated by a Reviewer in the "Examiner," as "a perfect Vade Mecum for the Farmer." In publishing it thus separately, I have followed the suggestion and judgment of several friends who are distinguished in the agricultural world. Parts have been re-written, and there is additional matter on new subjects interwoven with the original text.

I would here tender my best thanks to the Journal Committee of the Royal Agricultural Society

of England for their immediate courteous permission to make use of an Essay from their volume ("Time of Entry on Farms"), all claim to the copyright of which I had resigned by the conditions of the Prize.

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ESSENTIALS OF SUCCESSFUL FARMING.

A Place for everything, and everything in its Place—Estimating—Selling Live and Dead—Rothschild's Rule—Avoid Overbuilding yourself—Reading requisite—Grubs are not killed by Cold—Lord Dundonald—Sir J. Conroy—Speculation—Pastures, in what proportion to feed—Rowens—Cow, Horse, and Sheep should be combined—Economy—Dear Experience ultimately a cheap Article—Omnium Gatherum Box—Woods for Draining—Trimming Fences—Lucerne—Trifolium—Vetches—Rye-grass—Sainfoin—Upland Hay—Wheat—Barley—Oats—Burning Surface of Land—Festina lentè—Make safe the Line behind you—Demand—Weather—Water, how to purify—Dr. Muspratt—Soils—Ceylon—Variety of Crops—England a breeding Station—Ready, aye, ready—Draining with a Crowbar—Fencing—Whitethorn—Blackthorn—Holly—Furze—Linnæus—Open Fields—Seeds, how long they preserve their Vitality—Labourers vary in Worth—How to deal with them—Manures artificial—Home-made—Comparative value of Dung of Fat, Lean, Young, Full-grown Animal—Mr. Mechi—Dress for the Farm—Regular feeding of Stock essential—Ploughing—Medical Knowledge—How to bleed—The Cow's internal Arrangements—Medicine Chest—Gipsies—Preserving Skeletons—Salt—Quaint Receipts—Perseverance—Robert Bruce—Lime—Lime Plants—Archbishop of Dublin's Experiments—Rooks—Daddy-Longlegs—Farewell.

UNDER this heading I conglomerate at random, as they rise, all sorts of hints and ideas that have presented themselves to me in the course of my own

agricultural practice—general suggestions, drawn from that best of schools, experience, or what one's mind has assimilated from time to time from the writings of others, to which I must express myself far more extensively indebted than I can specially acknowledge.

It requires some smart occasional admonition to bring your men to understand that when a cart or roller has been used it must be put back at once, and not left outside, where the rain may penetrate the joints.

A place for everything, and everything in its place. This well-known saying holds especially good upon a farm. That heavy income-tax of rottenness that is entailed by leaving out carts, hurdles, sails, machinery, &c., in the rain, to be soaked and subsequently decay, would be almost incredible. Even iron should be kept under cover, and frequently have a coat of paint; a cheap, good, bright, useful kind of which may be obtained from Hill and Smith, though, probably, any manufacturer of iron implements will supply something of the kind. I only speak of that I have tested and found sterling.

How annoying it is when the waggon-shaft snaps off just as the team is ready to go to coal; or the drill goes to pieces in the gateway just when the barley land is waiting, and a beautiful season for sowing presents; and all for want of a little care in housing it from the weather during the winter.

Seven per cent. on the original outlay, with fair

management, should be ample to cover wear and tear. But how often is this the case? It is, of course, nobody's fault. You will be a clever fellow if you find out the author of such misdemeanours when a few days have slipped over the occurrence. The best plan is not to ask, for you will, as a rule, only encourage deceit, and get lies told you, but to look annoyed and take better precautions for the future. "The cat" did it, probably. She is a useful offender on the homestead as in the kitchen and dairy.

It is so irritating when a bright cold morning comes, and all hands are piped to the mangold-field, to find that there are no hooks to clip with; then a search takes place, and an hour is lost, and no inconsiderable temper, while new hooks have to be sent for after all, because no one ever knows about anything that is missing. It is so easy to answer, "I don't know." It is suggested that they were left on the mangold-field last year; and so probably they were, and so they ought not to have been: that's all I have to say. And so exactly with rakes and pikes in hay-time. Look before, my young man. Have your forces ready a month in advance, and your dispositions made at least over-night. Else you will have to grumble, if not suffer.

Estimating.—Let me advise you to take every opportunity of learning to value stock and job work. Have your ear, as your note-book, ever open, and your eye upon the *qui vive*. This accomplishment comes with diligence far sooner than is commonly

thought, and may be acquired as certainly as the labourer can tell the time at any hour of the day from the position of the sun in the heavens. Not only get taught to handle or eye an animal, so as to make a good guess at its marketable value, but you will find it of advantage to study the carcases suspended in the butchers' shops. You thus soon learn the value of a springing rib, that girder of an expansive frame, the seriousness of a defect behind the shoulder, the proper development of scrag, the profit that is owing to the tail being well set on, the hue of wholesome beside unsound meat, &c. Not only this, but ascertain the length of your regular step, so that, appearing only to pass by, you can tell by a few strides across and up a field the quantity of ploughing, ditching, and the like that a man has done during the day. By practice, also, you will come to determine a yard exactly at once, a talent that will be of service to you in taking rapid stock of a rick, mangold heap, &c., without the bother of actual measurement; as, comparing great things with small, Napoleon the First came to estimate with accuracy at a glance from the height above any number of troops deploying on the plains below. It paid me well once to watch the progress made day by day by an industrious young farmer—a capital workman, too—in laying a thick thorn fence on a farm he had newly taken alongside my own. Each evening, without his knowing it, I stepped the length of his day's work, making a note of it in my pocket-book, as well as of the average thickness of the stubbs, the species of wood encountered, &c. All

this I have by me as a valuable rule to refer to upon occasion. These apparent trifles not only have their exceeding value, as frequent tiny examples in mathematical study have, and will stand you in good stead some day, but they will further serve to raise among practical men their estimate of your powers, and this again will be of service.

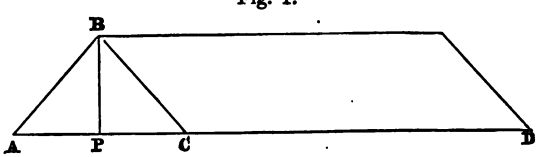
The contents of dung-heaps, clay-heaps, &c., are easily calculated thus:

1. Find the mean area, *i.e.* half the sum of the area of the top and the area of the base.
2. Find the mean depth, *i.e.* the sum of several depths divided by the number of the depths taken.

The mean area multiplied by the mean depth will give the solid contents.

In the case of dung-heaps, when the base is rectangular, the area is easily found by multiplying the length and the breadth together, and the solid contents are found thus:

Fig. 1.

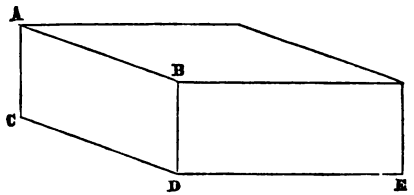


Note. × means multiplied into.

(1.) If the form be as in Fig. 1, where the breadth A C and the length C D are known:

The contents of the heap = $\frac{1}{2}$ A C × B P × C D, in cubic yards.

Fig. 2.

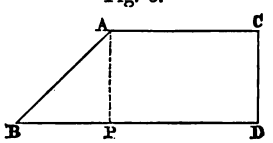


(2.) If the form be as in Fig. 2:

The contents = A C × C D × D E

= the product of the height into length into the breadth, in cubic yards.

Fig. 3.



(3.) If the dung-heap be against a wall, and of form Fig. 3:

The contents of the part A P C D may be measured as in the case of Fig. 2, and the contents of the sloping part A B P as in the case of Fig. 1.

It is easy then to find how many cubic yards a cart will hold, and the calculation is finished when you know the value of a cart-load according to local estimates.

Measurement of Haystacks.

A simple method is given by Mr. Stephens, which from stress of time, as the principle is constant, I

borrow: "To the height from the ground to the eaves add one-half of the height of the top above the eaves for the mean height; then multiply the mean height by the breadth, and their product by the length. Divide the gross product by 27, and the quotient will give the number of cubic yards in the stack; and that number of yards multiplied by the number of stones of hay in a cubic yard will give the weight of the stack in stones imperial. It is not easy to state the exact number of stones of hay in a cubic yard, as they must vary according to the compressed state of the hay in the stack, the age, size, and part from which the hay is taken determining the degree of compression, which varies as much as from 5 to 9 stones; but perhaps 6 stones may be near the mark in a new stack, 7 in one that has stood some months, and 8 in one a year or two old. [This applies to an oblong stack.]

"The contents of a round stack with a conical top is thus measured: Take the height of the round part from the ground to the eaves, and add to it one third of the perpendicular height of the conical top above the eaves for the mean height of the stack. Take the mean girth, which is found by taking the girth at the eaves and at the ground, and dividing their sum by 2. Square the mean girth, and multiply the product by the decimal ·0795, which will give the area of the base of the stack. Then multiply this area by the mean height, which will give the contents of the stack in cubic feet; divide the contents by 27, which will reduce them to cubic yards; and multiply these by the number of stones in the yard according

to either of the above suppositions, and the capacity of the stack will be found in imperial stones.

"To know the contents of a conical rick, take the girth at the ground in feet, find the area of the circle by the above method, and multiply the area by one-third of the height. The contents thus found in feet reduce to yards, and then multiply by the number of stones in a cubic yard."

Selling.—In selling at market for butchers' purposes, and not at fancy prices, there is a great need of practised judgment. In fact, the farmer can never come up in that particular with the butcher, who has such frequent opportunities of getting his eye in, by comparing what the beast brings dead with his idea of what he was alive. The butcher buys by handling, that is, after feeling the quality, the skin, &c., and can judge within a few pounds or ounces the beast's weight per quarter: this is a matter of eye work, much as guessing the number of square yards in a stack, and implies long years of study. Your best plan is to sell by weight, live or dead weight. Selling by dead weight is managed thus: Suppose the sheep killed, skinned, cleaned out, decapitated, just as, in fact, you see them hang in the butcher's shop; you receive so much per pound for what the carcase so dressed weighs. If 60lb. at 7*d.*, then you have 1*l.* 15*s.* This is called a sale at "7*d.* per pound sinking the offal" (that is, not taking the offal, the skin, tallow, heart, &c., into account, which is worth usually about a fifth of what you receive, and is termed the "butcher's quarter"). You cannot so lose, and the butcher

has his fair profit. It may suit you best, however, to sell by live weight: as, for instance, if you part with a flock of fifty or a hundred sheep at once to go away. The rule then is, weigh them either in a cradle for the purpose, which you can have with a weighing-machine, or, if you have not this useful machine, you may hoist them up to a steel-yard by a girth slung round their middle. If they be in fair *grass* condition they will waste when dead about half—the mountain sheep as nearly half as possible. For a sheep, then, weighing 60lb. alive, and sold at 7*d.* per pound, you should receive 7*d.* × 30; or, in other language, three crowns and a half. For a sheep, *corn and cake-fed in the house,* you receive 11lb. out of every 20lb.: for instance for a corn-fed sheep weighing 60lb. you should receive 33*d.* × 7, the butcher having otherwise more than his share, owing to the accumulated tallow within. The pig wastes one-eighth. You receive, then, for seven-eighths of his live weight. The ox wastes one-third. A fat calf weighs dead half its live weight and about 6lb. over: *e. g.* a calf live weight 101lb. weighed dead 57lb.

There is a mode of estimating weight by measurement, but this has the great defect of depending, after all, upon the uncertainty of terms: as, for instance, if the animal be "prime," the measurement is so and so; if he be "fat," only so and so; and there are scales sold for the purpose, but this is a very deceptive mode for a long time. You are told to calculate differently if a beast be "prime." How on earth is any one, without, at least, such practice

as should make him *au fait* at the simpler "handling" system, to tell when an animal is "prime?" Who is competent as a beginner, to distinguish between such shades of value? He may succeed once by accident, and the next time get a jolly "let in." Nay, rather buy the weighing-machine, which will be useful further as a means of testing the weekly growth of your stock. By the way, I would suggest that as soon as you can effect it, you decline altogether the market as a selling place. For your own learning and amusement you may take a saunter there, but otherwise try and get the name of your stock so high for quality of meat that butchers will rather come to you to beg a deal. Sending to market wastes your man's time, and entails the risk of your cattle carrying home contagion from confinement in pens adjoining the *profanum vulgus*.

As to the best time of weighing, whether before or after dinner, I cannot say. It is stated that a man weighs lighter after a meal. There must be a reason for it, I presume, though I do not know what it is. Is it that digestion inflates him, and that, balloon-like, he is lifted slightly from his ordinary anchorage, on the principle of the floating island in Derwentwater? Mysteries there are undoubtedly in weighing, simple enough perhaps to the professional; and I dare say, if we knew it, the butcher has a pull pretty often over us that we do not suspect. How curious is it that if a jockey be light for the scales, and just drink off a glass of sherry, he weighs immediately several ounces more! The alleged cause is, that the wine being tonic causes him to derive extra

aliment from the air. This is known, I believe, as a fact upon the turf. *Mais revenons à nos moutons.* Some purchasers require you to shut up the sheep all night. Such are keen youths, and this is not fair. A sheep grazing constantly must weigh about the same always. In the case of a pig one might, perhaps, with fairness be expected to split the difference, and take him half-way between his meals, when he can be neither too full nor too empty.

In selling grain there are many things to be considered—the home market, cargoes from abroad, &c., in regard to which you will, in the country, be safely advised by the *Mark Lane Express*, or some other agricultural journal. Perhaps Rothschild's maxim may help you. Wait until prices have been at their highest and are beginning to fall. At the first step downwards sell. One old farmer I know, who patronises the flail yet, as the straw is fresher for the young cattle, and who, partly from caprice, partly to test the matter, one year sent a certain amount weekly to the market. His profits averaged those of his most calculating neighbours. Insurance actuaries would, doubtless, trace a law upon the subject, which I for one should be curious to see.

Just by way of chat let me advise you, especially if only a tenant, not to lock your money up in building. I know a man who spent some thousands on a long range of brick and mortar boxes, &c., just a few years before his lease expired, and which the landlord refused to renew. He had, consequently, to remove with a large family to a small occupation, having wasted his fortune for the benefit of a mean

proprietor. Alas! that men should prey upon each other, as water wolves do! but so it is, and we must consequently beware.

The Scotch are given, notwithstanding, a good deal to this sort of work; they soon run up the solid stone sheds and engine-house with its prosaic chimney, but they have somehow or other, such an affinity for profits that they do not seem to suffer after all. Hence it is, perhaps, that it is so universally the fashion for the wealthy English commoner to select his bailiff from the land of cakes.

It were as wise, however, for a hen to imitate a coot, as for other natives of the United Kingdom to try to keep up with the cannie Scot in calculation. To their great credit is it notwithstanding.

Generally it may be taken as a maxim that a man who spends three parts of his capital upon an extensive range of stone buildings, is not likely to succeed, or "get the monish back." I remember a case of a long-headed farmer, on his own land certainly (one who, inspired with a notion, when he did move, went ahead with a momentum such as only heavy bodies can attain to), building a gigantic tier of pigsties, with boiler-house, and steam-engine, &c., for pork-feeding. There was not the market he anticipated, however, and the buildings are a monument!

To invest your sovereigns in great stone and slate houses for a stock speculation of this sort, seems very like firing grape-shot at sparrows!

There was another case of a spirited land-agent in the heart of Wales, who erected glass cow-houses of Titanic grandeur, with vines overspreading the in-

terior, the grapes to be ripened by the animal heat, and absolutely took an empty mansion for the sole purpose of hatching and rearing poultry by the patent incubator system to supply the London markets. At least he was in advance of his generation. It might have answered admirably, but success, I regret to say, rewarded not his enterprise. A curious, and surely unprofitable, practice was that mentioned by Young, as prevailing in some parts of Suffolk in his day, of tying up the cattle to posts in the field by a rough manger, and sheltered in front by a coarse screen of faggots bound together. They were regularly littered and the manure piled up behind them, a trench conducting away the drainage. A fearful waste, to our ideas, surely! Neat, plain, comfortable buildings you ought certainly to have, as an element essential to success; and if your landlord won't erect them you will have to run them up on a cheap scale; though landlords of substance are thawing in this regard, and some, as Colonel Pennant, are most generous. Plain rough slabs of timber, with a galvanised iron roof, are very durable and cheap buildings. There are, however, with the rarest exceptions, on most farms some sort of buildings, old barns and the like, to be made available by contrivance. Look at the Suffolk breeder's hundred guinea prize mare with her foal running in and out of a thatched wicker shed, well strewn, however, with dry bedding. See the long line of sheeted winners that the intelligence of the inimitable Parr has produced, and produces, from humblest lodging!

Perhaps the best advice is to suit your vessel to

your cargo, and if the farm you think of taking has few or bad buildings, and the landlord cannot, or will not give you new ones, then my advice is, let it pass.

Farm Profits.—The following is a fairly tested division. To cover rent, rates, and taxes, take 3–10ths; to cover labour and tradesmen's bills, 3–10ths; 1–10th to cover seed; 1–10th to cover keep of house, and 2–10ths to cover capital and management.

Reading.—Do not confine yourself to agricultural subjects, nor neglect reading altogether. 'Tis a capital well to draw at. The weekly agricultural journals will solve many doubts for you, besides keeping you up in the knowledge of what is going in the markets—meat, wool, tallow, &c. If in spring time your young wheat begins mysteriously to withdraw from existence, and your ewes throw dead lambs, and the foals are born but to expire, turn to the *Mark Lane Express*, and you will find an echo to your sorrows with probably an antidote appended. There is always an epidemic in such cases, unless the misfortune come of some exceeding carelessness on your part; in which case you will probably find out your error for yourself, though at a period too late to mend it. A literary drink of this sort, over a pipe, in the twisted seat on the lawn after breakfast, will point your plans, and put you up a good half-mile above your less studious neighbours.

Practice and reading together, as a sandwich, with just the pepper and mustard of occasional discomfiture to flavour it, that's the way to get on in the end, my young friend.

And yet just to show how little the profession generally avails itself of the advantage to be derived from books, only ten minutes ago, meeting an old and experienced farmer, I asked him, "Well, what about the wheat plant, there are great complaints of its being thin?" "Eh, dear yes! look at that field there" (pointing to one upon the hill in the distance), "it's nearly all gone; it's the grubs do it." "Clover lay was it?"—"It was."—"You mean then the daddy-longlegs' grub?"—"I don't know, I'm sure, I never heard of that sort." "Is it like this?" (and I drew a rough sketch of the pest on the back of a letter). "Yes, that's it; but I should have thought that the frost we have had would have killed them all; I'm sure they were ploughed down deep enough too." As if the nature that had directed the parent fly to deposit her eggs on the clover lay, would not have provided in some way for the protection of the offspring!

A widely prevailing popular error is it that worms, &c., are destroyed by hard weather. They need only bore deeper, if not otherwise protected by the trenches. They are not so neglected as the Crimean soldiers were. And instinct is often superior in its ways to reason. It is well known to the naturalist that "even very severe cold is not necessarily destructive of the vital properties of organised tissues; so that on a restoration of the proper amount of heat, their functions may continue as before." Fishes have been so completely frozen as to be brittle, and yet have revived when thawed. "In one of Captain Ross's Arctic voyages, several

caterpillars of the *Laria Rossii* having been exposed to a temperature of 40° *below zero*, froze so completely, that, when thrown into a tumbler, they chinked like lumps of ice. When thawed, they resumed their movements, took food, and underwent their transformation into the chrysalis state. One of them, which had been frozen and thawed four times, subsequently became a moth. The eggs of the slug have been exposed to a similar degree of cold without the loss of their fertility."

Nor, again, will extreme drought destroy them. "Many instances are on record in which snails and other terrestrial Mollusks have revived after what appeared to be complete desiccation; and the *eggs* of the slug, when dried-up by the sun, or by artificial heat, and reduced to minute points only visible with the microscope, are found not to have lost their fertility, when they are moistened by a shower of rain or by immersion in water, which restores them to their former plumpness. Even after being treated eight times in this manner, such eggs have been hatched when placed in favourable circumstances; and even eggs in which the embryo was distinctly formed, survived such treatment without damage." (*Carpenter's Physiology.*)

The only way really to grapple with them, and that is not of necessity successful, is to lime and salt the surface well before you turn it in. It affords, so, an uncomfortable blanket for the lodger, especially when you have further tightened your hold upon him by the help of Crosskill's roller. It is essential to remember this, since ploughing a lay in for wheat

has been so stoutly advocated on the ground that the vegetable matter so buried is admirable feeding for the young wheat.

Our friend, the advocate of this view, of a certainty can never have been acquainted with the daddy-long-legs' son and heir; a visit from whom, we can seriously affirm, once to have experienced is never to forget.

There is, or used to be, a notion that "any fool" would do for a farmer or parson. If a parent of means had a dull son, he always fixed him in a farm or sent him "into the Church." Both ideas are expiring, I am glad to say.

To be a successful agriculturist, as a useful minister, now-a-days, needs brains, heart, study, practice, energy, and kindness. At the homestead there must be an utter abolishment of all mouldy notions of wooden ploughs with four horses driven by a second man; as, in the pulpit, of lemon-colour hereditary manuscripts of dreary reasoning and vapid exhortation. There is more real life needed now, or the one may be relied on soon to empty his church, and the other to bolt at an early date before the bailiff.

What a farmer Lord Dundonald would have made, if he had taken to it! We should soon have heard of startling, yet solid improvements. The man who could set his pursuers on a wrong tack during the night by hanging out a lantern in a tub set adrift; who could, in defence of a ruined tower, appal a gallant enemy by a chevaux-de-frise all hung, seaman-like, with shark-hooks on knotted cords; and

who watered his ship, under dangerous circumstances, by lugging through the unwilling brine a foresail sewn up as a bag, and filled from boats

"By the blue rushing of the arrowy Rhone,"

would have soon, if it had pleased him, gone to the fore in the Southdown and Shorthorn line. "The like o' he" had kept the market stirring, as his solitary black frigate kept the coast of France on the *qui vive.* Witness only what the lamented Sir J. Conroy did during only four years' absence from the camp and court; more, in fact, by a long score than a whole legion of antique traditional agriculturists had done within a century, what with their hide-bound ridge-backed stock, their liming, their want of method, and their inveterate prejudice.

Since writing the above, in Dickson's *Modern Husbandry* I find frequent reference to a work by an earlier Lord Dundonald, *On the Connexion between Chemistry and Agriculture.* It is satisfactory to have made a so far successful hit.

Each day tie up all the small ends of your work as they occur, no matter how small individually; as each post you should tear up every letter you have answered, and have no need to keep; it is astonishing how rapidly and closely they accumulate in a few years, most certainly to be a nuisance and obstruction, just as a stout meal of mincemeat is more likely than most meals to lead to internal disorder, because you are apt to underrate the unit, and so insufficiently go through your mastication.

It is a bad thing in farming, as in any other pursuit, to let the mind range too far. It flushes birds there is no reason to disturb, and leads to unwise thinking, *alias* speculation. Confine yourself to the immediate—the needful. Life progresses despite and beside your planning and endeavours, and brings its duties all, as Francis's pike-tackle, with its hooks attached. There is a spice about the practical that keeps life comfortable. No visionary thinker but has dyspepsia, or the like.

Pastures.—One of the greatest mistakes a young farmer can make, is not shortening sail sufficiently as the year advances to maturity and old age. The vital powers of May supply a growth—when, in the old poet's eloquent language,

> —"quantum longis carpent armenta diebus
> Exiguâ tantum gelidus ros nocte reponet"—

that the slow step of September, and failing sinews of October, deny.

To feed down your meadows before winter, even to the quick, on the principle that all that springs will be deliciously sweet, may be all very well, provided you have plenty of stored fodder, but to do so when your rick-yard is thin, you may write down as unwise. Still pastures should be closely fed: 1st, by cows; 2ndly, by sheep; 3rdly, by horses. They each have their own duty. The more it is eaten down, the more feelers, rays, or blades the crown shoots out, as though struggling for existence. Especially the bird's-foot trefoil does this; but of the merits of this plant, thriving best as it does on a

damp soil, men differ. Hence it is that the more a pasture is regularly fed, the greater head of stock it will support. When a pasture is allowed to run up, each root is apt to favour a representative stem, as purse-proud man will try to make a grandee of his eldest son.

Whereupon all the family of subordinate blades has to strain and suffer, to support the intended "swell" at its head. Hence the crown is weakened and the crop is thin. Whereas, when this stem gets ingloriously nipped off by a browsing cow or ewe early in its career, the younger growth shoots forth in better heart and trim to work its way duly to a fair development that will repay the grazier better. By the same rule, some will allow an occasional otter to exist in a stream, and tell you that they have more sport for their forbearance; inasmuch as this animal assails mainly the larger trout and eels, which otherwise had caused far wider havoc than he does amongst the fish of lesser estate.

Before winter, get clear of all the mouths you well can, so as to save a stack or two of hay as a bank reserve in the event of a future dry summer, when the crop may be light. Live well within your means in respect of provender no less than money. To do so is one prime element of success and comfort. Keep turning often your capital up to a fixed line. Beyond that, if you can, have a few spare hundreds in the funds, which will put you in clover some day, when the market is glutted by the farmers forcing their stock in from shortness of keep or cash. Look out, then! Your trained judgment may pick up

under such circumstances, for a trifle, what may subsequently turn out a gem, as "our special correspondent" in India might have purchased at Delhi a diamond spray worth a fortune for a few rupees of "the ready."

There is a stupid clause in the leases of a well-known nobleman, that no cattle shall be allowed to graze on the sheep-pastures; but it is often broken. About Winchester, however, cows and sheep are kept apart; the cows being allowed only on the land that will not carry sheep.

In some dairy counties sheep are kept with cows in order to eat away the trefoil and clover, which are not reckoned good for cheese. "A Romney Marsh grazier would be ruined if he had so much grass on his field," wrote Mr. Boys in his farming tour, speaking of a field understocked. In a dry season, closely-fed pastures will continue to spring when the apparel of those more favoured grows miserably thin and decrepit.

Water meadows, especially when closed in May for a week's flooding, the connoisseur likes to have had eaten well down, right into the heart of the plants. The sweet generous sainfoin alone cannot bear its heart being trifled with after this fashion. Comply only with this demand of a sensitive nature, and you will be amply repaid for your forbearance.

Grass grows three times as fast if watered in a hot season, than it does at any other time; for the same cause, too, you will be surprised after a dry spring to see what luxuriant growth has been attained (almost a foot high the first week in May,)

by a low-lying meadow, whose roots are damp from the adjoining river when vegetation stirs not on the higher ground, and the uplands are absolutely burnt.

The more you feed a pasture down the more stock it will carry. As Mr. Hogg remarks: "The fact is, that on many of our forest and Eskdale farms, the more cattle they keep from May to September, the more sheep they can keep, as the former eat all the large, rich, and succulent grasses, which, unless they were mown, would lodge and perish."

An admirable mode of enriching land is mentioned by Young, as practised in his day upon the South Downs: "They sow forward winter tares, which are fed off late in spring with ewes and lambs; they then plough and sow summer tares and rape—two and a half bushels of tares and half a gallon of rape—this they feed off with the lambs in time to plough once for wheat:" thus the two ploughings in the fallow year are given at the best seasons; in autumn for the frosts to mellow the land and prepare it for a successive growth of weeds, and late in spring to turn them down. Between the times of giving those stirrings the land is covered with crops. The quantity of live stock supported yields amply in manure, while the treading makes the soil firm for wheat.

Mr. Ellman advocated the breaking up two-year-old lays for tares and rape to be treated similarly. This has been thought a far better way of enriching land than folding upon turnips. The turnips, these men say, "haul upon your pastures." Of all spring keep, undoubtedly, in point of hardiness, rye-grass

bears the palm. It grows at any time, and in spite of everything; it is so pushing in its ways. 'Tis February yet, and listen how the wind whistles. Whew! how long it will be before we have any grass, and the mangold heap is waning apace; how I wish that there were some more plants that would pride themselves upon blossoming during the prevalence of a N. E. wind. Young does not endorse the method of feeding and mowing pastures alternate years. He considers that a field mown annually is none the worse, if well and evenly dressed with manure after each crop. The sheltered damp of a hay-crop cut early he considered beneficial to the soil.

For spring keep it is the practice in many counties to allow one meadow at least rest to grow uninterruptedly after mowing. Towards the fall of the year there consequently is a thick mat upon it, much of which fades into juiceless hay under the frosty influence of winter, but which, pierced by the fresh blades in early spring, that come all the sooner too for the nursing shelter, affords a substantial juicy bite for the ewes and lambs at an inclement and otherwise short season.

Fields of this sort are termed "rowens," or "rouens," and are much in vogue on the east side of England. In southern France I have noticed it continually. A good mouthful of this sort coming dry and green together, increases every breeding mother's flush of milk amazingly—ewe, mare, or cow—while the tendency to scour is corrected. It saves, too, an immensity of hay, having itself given no trouble at

all. Less prudent farmers, driven to extremity, especially when as this year there has been a failure of the root-crop, have to pasture their young seeds, a plan which reminds one of living at the rate of 10,000*l.* a year for two days, as a certain friend of mine does once annually, having to put the screw on the 363 remaining days, in order to meet the delightful strain.

And now that we are upon the subject of grass keep, let me refer to the well-known saying, that oxen require a bite twenty-four days old, while twenty-four hours rest is sufficient for the sheep run. The fact is, that animals which have incisive teeth, such as the horse and ass, in both jaws bite short grass more easily than those which want these teeth in the superior jaw; and if the sheep and goat bite the closest, it is because they are small and their lips are thin. But oxen, whose lips are thick, can only bite long grass; hence harm not the pasture, nipping only the tops, not disturbing the roots, and so not checking the growth; whereas the sheep and goats destroy the stalk and spoil the root. The horse—selfish epicurean that he is — chooses the most delicate, and consequently the most persecuted, grasses, leaving the coarser only to attain to the maturity of the seed-pod. These coarse stalks the avenging ox decapitates remorselessly (to a certain point, when he requires the persuasion of salt and oil-cake strewn upon the too rank tufts); so that in a few years a field fed by horses becomes impoverished; whereas the ox pasture improves. The sheep makes up for its mischief by its incessant and

even manuring. Arthur Young reckons the rowen method the best known for keeping a full flock of sheep through April. "Tolerable rowen will carry ten ewes an acre with their lambs through this month. Rowen may be worth in autumn 10*s.* or 12*s.* an acre. In April it is worth 30*s.* or 40*s.*, and if it be a backward season, a farmer that has it would not be tempted to sell it for much more!" Upon pastures fed down before winter, you must expect no new growth sufficient for keep until the 10th of May; until the dark bud of the ash—most diffident of trees—has burst.

Linnæus has left an interesting table of the grasses (many hundreds in number), which are respectively sought or rejected by the cow, horse, and sheep, showing thereby a new reason for the intermixture of stock.

The *improvement of the grass* land he may have included in his taking is obviously of vast importance to the farmer. The treatment (including under this term at once labour and manure) which I would recommend from *personal experience and observation of the practice of others* as being best calculated to increase the productiveness of *existent* sward, is as follows. It is not intended to include the *laying down* of a plot in grass, for which the seedsmen give abundant directions in their annual circulars.

Given, then, a piece of pasture, the first consideration that occurs, is, does it require *Draining?*

If the land be wet and throw up marshes and carex upon its surface, then no good can be done with it until that stagnant water at the roots be re-

moved which is so deleterious to the growth of all useful plants. This operation, to be effectual, should be done after careful study of the locality, under the best advice, by skilled workmen, and with sound material. Otherwise it will be but time and money thrown away.

Pastures may, however, be drained too dry: in this respect care must be taken.

I was lately struck by the statement of a little farmer—a shrewd, industrious man who has a small holding under a Welsh mountain, one portion of which is intersected by brooks that make the adjoining land almost a swamp. I recommended him to drain it, having abundance of stone near at hand, and then to dress it with burnt clay pared off the abounding hillocks, ragged corners, and hedge-rows. He had thought of doing so, he said, but that there was no field in the neighbourhood to compare with it in the yield of milk and butter that his cows afforded when pasturing there, although he allowed that he had frequently lost young stock upon it, of course not knowing why except that they had "had pain." (They had probably died of neglected "Red Water.") Scattered between the brambles, bushes, sedge, rushes, and moss, there were certainly nice patches of Dutch clover and trefoil, with much succulent grass and bird's-foot by the ditches; but I am puzzled to account for the field's excellence in a dairy point of view, unless the extra moisture in the herbage can be credited with it, or that the long mosses are partially consumed in the bite and have some hitherto unacknowledged virtue, such as the

Reindeer moss of Lapland [*lichen rangiferinus*] has in the production of delicious butter.

Well then, the *draining*, if required, having been effected, I inquire next, Has the farmer the opportunity of *warping* this land? that is, has he the opportunity of letting tidal or river water charged with mud by means of flood-gates run upon his meadow, and of detaining it there in gentle flow or temporary stillness until it shall have surrendered for his benefit in the shape of a deposit its precious freight: such alluvial deposits being of inestimable value from the prime degree in which the various elements of fertility, clay, silica, lime, organic matter washed from higher regions are usually compounded therein. But this wealth is only for the few more fortunate. Besides that warping, in such districts as allow of its being carried on, is a science so well understood that with its mention I pass on, being thankful to have the opportunity upon my own farm.

Next. Does the pasture admit of being watered by a spring or brook? A catch meadow with the carriers skilfully cut, the temperature and composition of the water being favourable, is an adjunct of great price to a farm. By use of irrigation a mere rabbit-warren, belonging to the Duke of Portland, has been actually turned into meadow-land that lets at more than 11*l.* per acre. Occasionally upon a farm the rare opportunity occurs that judicious draining of one over-moist spot will afford the means of watering a subjacent meadow. The most memorable instance of this sort that I remember is the tapping of an apparently irreclaimable bog in the middle of a

plantation belonging to Lord Hatherton in Staffordshire, the springs from which being conducted into an extensive reservoir, not only turn a mill-wheel that works the machinery of the homestead, but are afterwards conveyed through a tunnel five hundred yards long, whence they issue to serve the purposes of irrigation upon a series of catch meadows below. Any water almost will answer in this way, but the best is that which is soft to the touch and dissolves soap; in which trout and water-cresses thrive.

Supposing, now, that the pasture under consideration is not capable of being either warped or irrigated, the first thing to be done on coming into possession is to dig a spadeful of earth up in different parts of the field so that the ingredients of its composition may be ascertained and a tonic prescribed accordingly. "In supplying organic matter," it has been well remarked, "a *temporary* food only is provided for plants, which is in all cases exhausted by means of a certain number of crops: but when a soil is rendered of the best possible constitution and texture, with regard to its earthy parts, its fertility may be considered as *permanently* established. It becomes capable of attracting a very large portion of vegetable nourishment from the atmosphere, and of producing its crops with comparatively little labour and expense."

Having got this soil up, if you do not wish to go to the expense of paying some guineas to a regular professor for an exact scientific analysis of the soil, you can roughly effect your purpose as follows. The presence of *clay* in a soil you can detect by its adhe-

siveness, *sand* by its roughness and by its scratching glass when rubbed against it. The presence of *calcareous* matter may be ascertained by pouring some spirit of salts upon it, which will cause it at once to effervesce.

To detect the amount of *organic matter* in the soil, thoroughly dry and then weigh it. Then subject it to a red heat, and when cool weigh it again. The difference in weight will indicate the amount of organic matter. The presence of metallic oxides in a soil may be known by their colour. Ferrugineous soils are red, &c.

The BEST SOIL, according to the analysis of Bergman, contains *four* parts *clay, three* of *sand, two* of *calcareous matter,* and *one* of *magnesia.*

Keeping these proportions in view, you may, after analysis, local circumstances favouring, and the railways now have widely extended the convenience, supply the wants of your field. It is a singular provision of nature that when a want exists the means of satisfying it are usually at hand if fairly sought for, as poisons are said to have in their native region an antidote beside them. For instance, beds of marl are often in close proximity to the sandy soil that needs its admixture. One friend of mine is particularly fortunate in this respect. His estate extends over a sort of promontory, evidently thrown up by volcanic action at some period, and is almost encircled by a river; the various adjoining fields of which must have been once hollows of an ocean-bottom, wherein various kinds of detritus (animal remains, shell, rotten wood, the wash of rocks, &c.) subsided. Herein now

he has an inexhaustible storehouse of material for the compounding of a first-class soil. Acting upon the hint in one instance, he carted, during winter, on to a tract of hungry silicious gravel great cakes of heavy blue adhesive clay that effervesces briskly with a taste of spirit of salts. The frost, sun and rain did their part; and that so well that he reaped this year a crop of wheat off that once jejune gravel equivalent in value to the fee simple of the field itself at forty years' purchase not a very long time ago.

This same gentleman bought in Ireland a tract of some bog lying under a mountain, upon which there were some of those excrescences, so common in that naturally favoured country, of lime-clay (that is finely comminuted limestone *débris*) turfed over. Having drained the swamp, he directed a brook from above on to it by a cutting through these mounds. The consequence was that in a very short period he had quite changed the aspect of affairs: the rough surface of the lately sour swamp being carpeted thickly with fine grasses, clover, &c., so that he sold the property again, having doubled the purchase money.

On to clay then cart silicious sand (which, if it be from the sea-shore and abound with broken shell, is a dressing that applied either raw or burnt immediately changes vegetation for the better, the change too being a lasting one). *On to sand cart marl*, and on *to both organic matter* as you can afford it, in the shape of rich straw-home-made muck. Thus you cannot do wrong: rather, if due judgment have been used, you will be eminently successful.

If, however, you elect by preference to send to a

professor for an exact analysis, you must mind and take a variety of samples from several parts of the field, during dry weather, and you must keep them in glass-stoppered phials.

There is another excellent guide close at hand, and that is the family of wild indigenous plants that flourish upon your ground. These if you carefully gather and botanically identify (a most delightful occupation, *experto crede*), you may ascertain the ingredients of your soil; for lists of the plants special to each kind you will find systematically arranged in any of the best publications upon general agriculture. For instance, to enumerate a few briefly, the growth of sainfoin always shows a calcareous soil: the common colt's-foot, blue clay: the rush and the potentilla, clay: wood-sorrel, the presence of iron: the field horsetail, a retentive, clayey subsoil: the nettle, nitrate: heath, peat: the poppy indicates silica: the pimpernel and thistle, a good loam: the restharrow, a dry, barren soil over rotten rock, &c., and so on over a long list, the full enumeration of which would exceed our limit.

Before this carting of subsidiary soil commences, however, you will do well to scarify the surface of the meadow remorselessly each way with sharp-tined harrows, so as to tear away the intrusive moss and let air in to the roots of the grass. Next scatter upon it (about 10lb to the acre) a quantity of "renovating" seed, which you should obtain from a first-class tradesman, who will take pains with the mixture if you advise him as to the nature of the soil, and will send you only *sound, fresh* seed, free from

the adulteration that is too shamefully frequent in the case of some firms. This drive home to the fresh soil by persuasion of a heavy frame stuffed dense with short, prickly blackthorn, in agricultural parlance, "a bush-harrow."

A more interesting, a very certain but a much slower and rather Robinson Crusoe mode of obtaining the requisite seed, would be to spud carefully out every possible weed in a piece of good sward upon a kindred soil, to dress it well, and to take a hay-crop so late deferred that the seeds are sufficiently ripened to grow the next season. These then you can use by way of "renovation" upon the weak pasture, adding, if you choose, some handfuls of Dutch clover, and trefoil seed, which never come amiss under kindly treatment. The first drizzling day you can apply three cwt. an acre of guano (the specialty of which is to improve the upper growth of leaves, not bulb), which the rain will at once beat down to the roots. Then close the gates and leave your meadow to its repose.

A young or renovated pasture should by no means be fed off with sheep. As Mr. Thompson once pithily remarked, "amongst young grasses the gnawing tooth is more than a match for the golden foot." In our light soil district I never allow any grazing of the young "seeds," as is the universal practice around me. The consequence last year was that my crop was a marvel amidst my neighbours at their market dinner. Each nip of the sheep's tooth destroys a clover rootlet, added to which they tear up the tender grasses by hundreds from their hold.

To return to the consideration of our meadow, it is an approved plan to allow this first crop after "renovation" to shed its seeds before cutting. The hay is of course inferior to what it would have been if cut in time—more woody and deficient in saccharine matter—but it is a loss which may be reasonably accepted as a small per contra item against a most valuable permanent improvement. Nor will the cattle complain much if it be chopped up with pulped swedes towards Christmas time.

Through this process of studying the indigenous plants of the district, the kidney vetch, to name but one of many, came into vogue, clothing now as it does whole twenty-acre fields with its lovely golden bloom and quaint leaf that is so valuable as sheep feed, instead of wasting its existence by the roadside or in the hollow of an abandoned quarry.

After mowing, which is an exhaustive process, beside that grass and clover seedlings require plenty of sustenance to keep up their heart, apply a good dressing of half-rotted farm-yard muck: *half* decomposed, I repeat, that is, somewhat strawy, so as to protect the springing blades, while it affords material for the industrious worms to draw in and reduce to mould, sufficiently gluey again to afford the roots with the first rain an invigorating draught of that oily soluble mucilage which is a main element of the so-called "Vegetable Extract:" washed and squeezed of which a soil is worthless, as has been repeatedly shown by the experiments of the scientific.

It will be well to keep the flock off the "renovated" pasture as long as possible, so as to allow the

seedlings a fair chance of anchoring beneath the surface. Then feed by preference with young cattle stock, whose bite is not close as is that of the sheep. Eventually the "golden footed" will do most good, but at first they are hurtful for the reason stated.

I omitted above to direct that after harrowing the pasture should be rolled with a Cambridge or Crosskill crusher. They answer far better than the plain smooth roller, because the hollow made by the rings and spikes respectively serve to retain moisture beside the rootlets, whereas the smooth roller leaves the surface like King Alfred's cakes, apt to dry too quickly and get burnt. Worse still, if it be clayey, the surface runs the risk of being "hide-bound," as the farmers term it, and so impervious to the starting blades.

Having arrived thus far, it becomes us to decide what manurial application shall be best henceforth.

The "grass manure" sold by the manufacturers is full of phosphate of lime, and so pre-eminently serviceable to the leguminous plants that form so valuable a part of the best upland hay. But these artificial manures after all are they not a sort of stimulant? rather of a gin-and-water nature than solid beef and pudding for the plants. And if that be, as I suspect is the case, then are they most costly. Let us cast about for something cheaper and less evanescent. If a stimulant be desired, with a view to "quantity, use guano, nitrate of soda, or other ammoniacal manure:" for "quality use lime or bones" (Thompson). Wood ashes and burnt clay are excellent promoters of clover growth: so indeed is

any burnt stuff. Pond mud and peat require mixing with farm yard manure, when they become by the next year good compost. Lime, to yield its full virtue, requires heat. Dusted thickly over a meadow before the autumnal suns have lost their power, it is provocative of the trifolium tribe in an eminent degree. Gas lime should be fine powdered and very thinly spread, or it will do more harm than good. Marl is beneficial, especially to a sandy soil, owing to the calcareous element it usually contains as well as its unctuous character, which is supposed to be a trace of decayed animal matter embedded and dissolved in it long ages ago. Spent tanner's bark is of little use, except to soak with liquid manure, and spread thinly upon the surface, where upon a dry soil it helps to retain a certain amount of beneficial damp.

There has been of late sold as a grass manure the *pressed off-scourings of beer barrels* at the great breweries, which a friend tells me he has used with signal success. This material is not, however, to be obtained in any quantity. *Stone clay*, where obtainable, has been productive of wonderful results, especially in Cheshire, where bones raw and boiled are also stated to have restored in astonishing measure the phosphates of which the dairying robbed the pastures. *Bones* are, however, uncertain in their effect, and I recommend the beginner to try small plots of his pasture with these expensive special manures before he ventures upon a large outlay. Disappointment might not only cramp but disgust him. The same may be said of gypsum, the result

of which one sometimes finds imperceptible, sometimes a superlative help. One old-fashioned plan I have often seen adopted in Wales with gratifying issue.

They are accustomed in that country to plough a deep furrow six to eight feet in width around a pasture that they wish to improve, and on to this cart quick lime, which when slaked they scatter thereupon and harrow in. The next spring they spade it up and spread the compost over the field. The result is sure and lasting. The theory of this treatment is that upon the headlands (which are, by consequence, commonly raised above the level of the field,) there accumulates gradually in the course of years, even if there be no ditch the scouring of which has been for generations laid up in heaps, a coating of decayed leaves from the hedgerow, further enriched by the droppings of the animals that are wont to shelter there from rain and wind, beside a certain soak from the woolly sheep's coat. An earth and lime compost—or even earth alone, especially virgin loam from a common or hillside—will work wonders on field or garden, but still richer and more feeding is the compound of lime with what in culinary language one might term this good "stock." A regular dressing for grass land in some parts of Lancashire is what they term "shoddy"—coarse woollen rags—the main benefit of which one would suppose to arise from their oiliness and the shelter they give the plants. I have seen heavy hay crops therefrom, mainly however consisting of coarse benty grass.

The effect of repeated waterings with *liquid*

manure, especially in one instance, where the outflow of a kennel of harriers drained into the farmyard tank, I have found to feed the large grasses into rankest development, the trefoil that existed before proportionately disappearing. Upon Italian rye grass this liquid told surprisingly, but it was signally deleterious to the cherished constituents of prime meadow sward. I would not then use it for "renovation."

The *solid sweepings*, again, of this same kennel, gnawed bones and the like, produced quite an oasis of dark green hue in an adjoining orchard, which the flock grazed to the quick, making for it at once on admission to the pasture.

Moss, that bane of weak pastures, it is frequently said, will only recede before a thick coating of muck which shall so strengthen the grasses that they can overpower and supplant the intruder. I have tried this recipe in vain, and I have found equally fruitless the plan of folding sheep upon it until it was positively black with the treading and ordure; but a cure at last I did effect, and that by an accidental application. Being short of straw one winter, I had to buy deal sawdust by the truckload, so that my farm boxes had quite a menagerie appearance. Every morning the saturated portion was wheeled out in a barrow and spread at once upon, as it happened to be nearest, this very mossy spot. An effectual cure has been the result, and at length the unimpeded grasses wave a triumphant head over the grave of their persistent foe.

Best of all beneficial dressings for grass land is

the *midden from the cottager's door*, being a compound of coal and wood ashes with the pigstye muck, rags, paper, broken mortar, soot, garden and culinary refuse, &c., the whole heap regularly saturated with the house slops and soap suds. But of course this in any quantity it is difficult to obtain. Still, if method be adopted in the application, and a few extra pence per load be offered, the farmer will not be long in treating at least his home pastures to this dressing. The seeds of various weeds, but especially groundsel, which flourish too frequently in the border of cottage enclosures, are apt to be imported in this purchase. Such noxious growth, however, cannot establish a footing in pasture as in plough land.

A curious fact that I have often noticed is, that if a lawn be laid down with the very rankest turf, cut under trees or anywhere, and after settlement be regularly and closely mown with a *lawn mower*, it will gradually but certainly come to be clothed with a wealthy soft carpet of the most delicate tiny leaved yellow trefoil and honeysuckle or Dutch clover, while the coarse crowns of the benty grasses disappear, superseded. Whereas, were this same lawn only *scythe mown*, the benty grasses with their crowns clean pared out would have remained, but no new clovers sprung. Whether the close bruising cut of the lawn mower does it or not, I don't know; but it would be a great boon if we could get a machine to do as much for our pastures. School-fields and playgrounds, from the incessant treading, become excellent sward. Before concluding, I should remark that it is essential to clear away the noxious ant-hills

from the meadow that is intended for mowing, for no one who has once experienced the discomfiture of having the knife of his patent mower snap off short just as it was beginning to "do beautiful work" being choked in its attempt to pare the obstacle away, and still obliged to obey the superior force of the horse's draught, can ever forgive the ant-hills. It will not answer to slice them with a spade and strew the pieces about, for the villain horde only lies temporarily *perdu* in the grass, while the enemy is at hand, on the farmer's departure to arise and repair their stronghold. The proper way is to shave the mound clean away, and turn it upon its head upside down. Then the rains will descend and overwhelm the hapless inmates; for such is the attachment of this economic race to the habitation their labours have erected, that they will not leave it even when subverted. So they get chilled or frozen up, besides being pecked at mercilessly by the inquisitive feathered tribes. Or if hedge clippings be at hand best burn them *en masse*.

Lastly, I observe that the superlative pastures of Ireland owe their priceless verdure and fattening quality in a great degree to the fact of the rich loam (clay and pure sand are rarely found in Ireland) in which they flourish, being a close layer upon lime-stone rock; so that they enjoy thorough drainage, while sufficient warm moisture is returned to them in the guise of showers, for which they are indebted to the proximity of the Gulf stream. Extra excellent are they where the Atlantic breezes immediately reach, bearing on their wings the salubrious sea foam.

Economy.—I often watched until I learnt a lesson from my bailiff's wife. People in that class are not often provident, but when they are, it is astonishing how much real comfort they can extract out of a little, and how far they can make things go without appearing mean or stingy, being simply cleanly and careful. A good mode of teaching yourself economy is this: whatever you may feel an impulse to purchase—and the youngster has many fancies—every new invention—consider whether you cannot manage to do without it. Note down the price in your pocket-book, and allow a short time to elapse. Wrestle with your inclination; the bright colours of the wished-for object fade, and your desire is gone by. Do this once and again, and when the circling months have fled, just add the page up. Consider whether you have not enjoyed yourself just as well as you need, and then see what a nest-egg you have saved. *Experience bought dearly* is in the end, if you use it shrewdly, a cheap article. Supposing you may have lost a twenty-pound note in an unfortunate deal or speculation, tighten down the above mentioned screw on your own private expenditure, but not so that those about you feel it, an extra couple of twists. Make careful registry of the things done without, and you will find, sooner than you expect, that you have not only improved your habit, but have laid up thirty pounds in lieu of the lost twenty.

Cash credit.—A justifiable means of increasing your capital, where your prospects are pretty safe, is the obtaining what bankers term a "cash credit" at

your local bank. This a young man of character will always be enabled to effect; he will always have some respectable friend or relative whose security will be accepted at the bank for what extra money he may require up to a fixed mark, say 50*l.* to 500*l.*, according to his need. For this accommodation, which has been the means of making many a young man in business and farming, a certain rate of interest will be charged, with a commission to cover the necessary incidental expenses. Meanwhile the young farmer pays in his receipts and draws for his need within or up to, but not beyond, the fixed limit; until, in time, if he be prudent, as he should be, he will have the means to clear himself of the obligation. A *cash credit* is, to all intents and purposes, additional capital, and the person using it holds an intermediate position between the man who takes a farm, to which the insufficiency of his means does not allow him to do full justice, and the more enviable owner of an ample independent fortune.

The cash credit system, within moderate limits, is by no means an unsafe one for a reasonable and prudent young man to avail himself of.

Bills.— for the system of giving bills we cannot say as much; it is too well known to need any explanation, and, as it is a system which I should recommend the young farmer firmly to avoid, I shall pass it by without further comment.

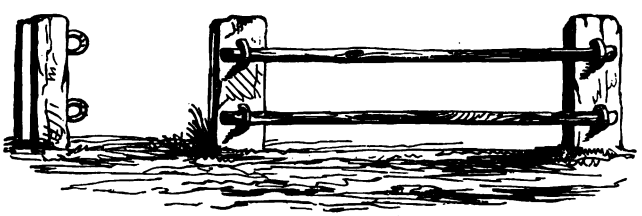
Jobbing at Sales, as a means of tiding over the difficulty of entering upon a farm with insufficient means, may be fairly deemed a discreditable and

dangerous practice, which it requires more judgment than the young farmer generally possesses to render profitable. It is looked upon with suspicion by those whose good opinion is worth obtaining, as being too often nothing else than a cloak for absolute bankruptcy.

Insurance.—Insure at once all your stock and crops, or rather effect an insurance on what you calculate will be about two-thirds of the value of the regular crops and stock upon the farm; it will be a comfort to yourself, as it is a duty to your family. As a corollary to insurance, it is a good plan never to allow a light in your stable, or if there must be one, let it be enclosed in a good lantern, as servants in this respect are too sadly careless. By no means, under any pretence, allow smoking about the premises.

Capital.—Turn your capital over continually; small and frequent profits you will find the surest source of wealth.

There are few things which do not turn up some day of use; for instance the old horse-shoes which



abound along the yard wall, or the stable windows, and on the pillars of the court, let your bailiff store

in his *omnium gatherum* box; their ends elongated and pointed by the smith, they serve gallantly as loops driven into side-posts when you want a shifting set of rails. (See Illustration, page 42.)

Again: the autumn and winter clipping of your thorn-fences, which the maids storm at if you import them home for oven work or fire-wood, can be trampled with good effect into drains across the meadow land, which your men may open during slack time in the winter months. Drains so constructed answer sufficiently on pasture land, where the object is not to render the land too dry; and when, after a few years, the silt has stopped them, it takes but spare hours, when there is nothing else particularly to do, to reopen and restuff them. I may add, that if heather be accessible, it is far better for the purpose; but better still are water-trees. The alder, willow, &c., last longer—and should they not?—than the dry soil trees, the beech, ash, pine, &c., which resist the being put to that which Jeames would say is "not their work." Whether, however, it be taken aback by the situation, or grow to like soaking in its age, the beech answers well for wood-work in the wet Cornish mines, but requires to be kept under water, or its place soon knows it no more.

In the construction of the crannoge, or ancient lake dwellings of Ireland, a kind of lodge built on stockades in the centre of a lough or tarn—corresponding, it would seem, to the habitation of the Pæonian tribe on Lake Prasias, mentioned by Herodotus—the stockades were made of oak or

alder; oak of course as the sturdy prince of native trees; alder for its water properties clearly. Beyond this for draining purposes, the pliancy of the willow and broom are an important consideration. To revert, however, to what we were saying about the occasional unforeseen use which may be made of "old stores." I have lately seen a serviceable, as picturesque, drinking-fountain made in a spongy spot by simply clapping upon the eye of the spring the two fragments of a broken circular cider-press, which for years had lain useless at the rear of the last tenant's barn, with a subterranean pipe to conduct the overflow away to a pond below.

I have just returned from a stroll around my fences. Just before the grass runs to seed, it is well to have the bank trimmed of the weeds, thorns, and briar-shoots, by an old superannuated labourer, at a halfpenny per perch. This gives the farm a very neat appearance, and prevents the needless circulation of rank seeds, for which, depend upon it, you will in windy days be sufficiently indebted to your neighbours. But it is a doctrine to which you will scarcely assent if you be a sportsman, lest the game be disturbed. Much of the hatchings, however, will be over then, and sufficient cover left when the seed-pods are severed.

If, however, you adopt the plan—as nothing on a farm should be lost, while judiciously used the very simplest articles may often be made of use—let us see what is done with it. Every other year it does to pile up a thick roof on the rough gorse sheds which are at the various corners of the pastures to

serve as shelter to the stock. With this view it does just as well as a straw thatch. Or it is carted to any field, the surface of which it has been decided to burn. For this purpose it is almost better than straw; the matted grass and dry brushwood keeping life longer in the fire. If there be no field to pare and burn, then your trimmings of the rough clay-hedge banks may be charred—not too red, mind, but of a brownish hue—to sieve and mix with superphosphate for the turnip drills.

GRASSES.

Lucerne is a prime plant to have an acre or two of, somewhere near the stable. It should be kept beautifully clean, well forked and manured, to pay. It is of a retiring nature: weeds soon kill it; but with fair play it is, perhaps, the most profitable green food the farmer can grow. Once in, it lasts so many years. Trifolium is at the mercy of the villain slug, whose slimy clothing, correspondent to the blubber of the cetaceous tribes, enables him to stand the cold far better than his mailed relative, the snail.

Red clover disappears the third season if grazed. It sometimes lasts a third year, if mown only; but lucerne, treated as it should be, will faithfully attend on parade, and has been valued at 30*l.* an acre before now. One acre on rich good ground, and perfectly well manured, it is stated by an eminent authority, will maintain four or five horses from May to October. But it is best to make safe and allot an acre each. A balance on the right side is just as well. Some cut it with wheat straw into chaff, for

horses. It goes so much farther so. For cows, it is not safe food; being apt to blow or gripe them, especially if given too fresh, or with the dew or rain upon it. It should be allowed to wither somewhat in the sun first. Cows fed on lucerne alone are subject to an offensive, weakening eruption.

Trifolium incarnatum is a wonderfully profitable plant when you can secure a crop from its especial enemy the slug. Put in on a clean wheat stubble which has just been scratched over with harrows, then rolled down as hard as possible, and, if you please, just a sprinkling of guano or superphosphate to raise its spirits; it comes very early in the spring, and allows of three cuttings; it is less dropsical than vetches, and goes, consequently, much further in the fold-yard. Subsidiary patches to come on in the later part of the summer to aid the weak period before the aftermath starts, are best put in in April. If you cut it before it breaks into flower, it makes good hay.

Vetches.—The spring and winter sorts, distinguishable by the leaf, everybody knows something about. I would only say manure well for the greedy thing, but it is not ungrateful. It has a way of almost breaking the beginner's heart, however, when short of keep, being a sympathetic plant, and apparently incapable of rapid growth until the plants just meet across the drills. When once they clasp each other, then they steam along in earnest, and are upon you almost before the sheep crates are ready for the folding.

Rye-grass has been all but a failure with me continually, but it is wonderfully eulogised by many. I

can only speak of my own experience. It seems to demand great quantities of drink from the liquid manure tank, and so supplied is said to thrive amazingly. It is censured by some, for leaving an unwelcome remainder of couch-grass in the land it has occupied. Intended for hay, it should be cut before the stems have grown too strong, or the seed begins to shed.

Sainfoin.—But sainfoin is the grass (holy hay, as it has been well designated in France). It should be sown in clean land, and will last for years. It is first-rate food for cattle in spring, not making them hoven, and increasing creditably the yield of butter and milk. Fed by sheep in autumn and winter, it fattens them very speedily. It moreover improves the land on which it is grown, by drawing up supplies from the chinks of the rock; it is a miner amidst vegetables. A mangold-root that broke into an old quarry is recorded to have attained an apoplectic size, and its history is continually used in favour of giving the crop great depth to grow in; but it proved itself a selfish individual, soaking in and swelling personally, but exerting itself not at all for the good of others; whereas the sainfoin leaves the inheritance of an accumulated soil to its descendants. Strange is the destiny and vocation of this brilliant plant. By profession acquainted with the deep secrets of the earth, yet it is elegant to look on in its pink costume. If cut in May before the bloom is out, it makes most excellent hay for horses. Mown green and carried to the fold-yard, it rivals lucerne (without the risk that attends its use) in laying beef upon the oxen.

In autumn it affords the rarest of bites for sheep; especially as it delights in a dry lime-stone ridge. And more, when it has fulfilled its term of years, from twenty to thirty if properly treated, it leaves what the ornate of society too often fail to leave, an improved property for those that are to follow.

The following equation represents what has been calculated to be the comparative merit of clover and sainfoin as feeding stuffs: 39 of sainfoin equal to 1000 of red and white clover.

Hay.—As hay for your hunters there is nothing like the "best upland." It is fine, short, full of varied herbage—trefoil, clover, &c.—and deliciously scented. The term "upland," I may as well explain, applies to such pastures as lie too high to be flooded. The drawback to them is, that in hot seasons they are often burnt up, and they need continual manuring, which the rich, low, alluvial meadow receives sufficiently from the occasional overflow of the river. The feed upon the lowlands is comparatively coarse, and the hay from it is apt to be gritty and soiled from the floods, as was found, I believe, especially last year, in the cargoes that were imported from the banks of the Shannon.

NOTES ON GRAIN.

Wheat weighs from 56lbs. to 60lbs. the bushel: the miller's weight is 61lbs. *Barley,* 44lbs. to 47lbs. *Pease,* 63lbs. to 66lbs.

A man with a binder may reap an acre of wheat and something more of rye, in a day, if it stand well, and of pease, vetches, &c., one acre.

Wheat is ripe when the straw is turned yellow; when it hangs its ear, and, no greenish tint appearing in the middle, the grain ceases to derive benefit from the roots: when you bite the grain and find it hard. Some cut the crop unripe, as it is said to yield more flour and less bran when it has ripened on the ground, as the Flemish prefer to harvest their garden seeds. The usual produce of wheat is from twenty to thirty bushels the acre. Professor Thaer has calculated that in general wheat gives double the weight of straw that it does of grain—on elevated ground something less; on low grounds something more. Barley is ripe when the reddish colour on the ear is off; when it hangs its head and the straw has lost its verdure. This seed is not apt to shed; it may, therefore, be out long. Mind and not house it green, or your sample will be second-rate. Mow-burnt, it makes worse malt. Common produce, two to three quarters per acre. (*Mortimer*, one hundred and fifty years ago.) If you are driven by the season, or any other cause, to sow your barley late, soak the seed for twenty-four hours in water with sheep or pigeons' dung dissolved in it (guano?). You may thus sow till the middle of May.

When barley is sown thin upon a rich soil, the straw is apt to be long and coarse, and consequently inferior for feeding cattle. Nor is the sample as bright as when the seed was put in thick.

Black Oats—the kind preferred, I understand, by trainers of race-horses—like moist, cold land. They are ripe when the straw turns yellow, and the kernel hard; when the chaff begins to open and display the

seed. Some choose to leave them out through light rain, as it is considered to plump them (how shall they be sure that the rain will suit their convenience and leave off at the fitting moment?). But they house them as soon afterwards as possible, or they will shed. Oats may be carried wettest of all. (*Mortimer.*) I should say avoid wet devoutly in every case, as mustiness cannot pay in straw, grain, hay, or roots. In Sweden, most seasons the oat crop has to be dried on poles or frames, as you may see hay stuck up on the shores of Lake Constance.

White Oats shed most as they lie; black, as they stand. White oats love a dry soil—common produce twenty bushels per acre.

Seed Corn.—In selecting, beware of being deceived into buying, as a sample for this purpose, washed, kiln-dried grain—that is, grain bleached by the fumes of sulphur—for it will never grow. Potato sets, new German theorists say, should be half baked, as a preventive against the disease; but beware of baked wheat for seed. To detect washed corn—if it be bright, clean, and shining, not strangely dry, but feeling cool and slippery as you run it through your hands, you may fairly judge it to be in a natural condition. But if the end of the corn be whitish, with the least dark tinge upon it, and the corn do not shine, then most probably it has been washed. Chew a few grains, and if you taste them sweet and they grind mellow between your teeth, it is good; but if they have a bitter, raw taste, and are rough between the teeth, then probably the seed has been washed and kiln-dried, and is unfit for seed. The

above hints on grain I have taken mainly from Mortimer.

The yield of England now-a-days you may judge from the following table, which I have taken the liberty of abstracting from Mr. Caird's able volume on *English Agriculture in* 1850–1:

	Average Produce of		
	Wheat.	Barley.	Oats.
	Bushels.	Bushels.	Bushels.
Buckingham	28	32	—
Oxford	28 to 32	40 to 48	—
Western Oxford	20	40	—
Cotswolds	20	32	—
Vale of Gloucester	24 to 28	40	—
Devonshire	16 to 24	32	—
Dorsetshire	20 to 22	32	—
Salisbury Plain	20 to 28	40	—
Hampshire	34 to 36	40	—
Basingstoke	34 to 40	40 to 60	—
Berkshire	30	40 to 48	80
Surrey:			
Guildford	28	40	—
Weald	12 to 20	—	—
Sussex	26	—	—
Essex	28	40	—
Suffolk	32	44	—
Norfolk:			
1839	25	31	—
1846	29	33	—
1848	36	45	—
Fens	44	—	—
Notts	40	40	—
Mr. Paget's farm	46	65 to 68	—
Leicestershire	24 to 28	—	—
Cheshire	15 to 30	—	30 to 36
Lancashire:			
Mr. Longton's farm	40	60	—
West Riding	32 to 56	64	—
Yorkshire Wolds	28 to 32	32 to 40	48 to 64
Durham	32 to 40	40	60
West Cumberland	30	—	45 to 48
Northumberland	24	—	—

	Average Produce of		
	Wheat.	Barley.	Oats.
Northumberland:	Bushels.	Bushels.	Bushels.
Beal	30	40	44
Wandon	30	36	44 to 48
Wark	36	—	72
Derbyshire	30 to 36	—	—
Northampton:			
Overston	34½	45½	—
Bedfordshire	35	42½	—
	Improving.	Stationary.	—
Herts	35	40	—
Huntingdon	32 to 36	50	—

By looking alive, reading carefully the reports and leaders of the best agricultural journals, and comparing old statistics, you may manage exceedingly well, but you are not to flatter yourself that you will altogether escape disaster on your stock account, or loss in your dealings. Wherever live animals are kept, as Mr. Jessop playfully remarked to a purchaser, you must expect some deaths. On the other hand, while men continue to live upon each other, requiring laws to keep them straight, so long your innocence runs the risk of being overreached.

Further, it does not do to follow *swells* always. Do not—being a tenant-farmer, without Leadenhall Street at your back—venture upon a network of subterranean iron pipes to make a rainy day at any time. In their place, with all accessories on a fitting scale, this policy, I doubt not, pays. Nor buy a Burgess and Key for a dozen acres of meadow. I have known a great authority burn down three stacks of straw for the sake of the ashes, ignorant, I pre-

sume—as he ought not to have been—that in so doing he was releasing one main element, the vegetable, to its own sweet will, and, perchance, his neighbour's benefit. Columbus was more awake when he weighed the smoke of his pipe by calculating the difference between the "baccy" parcel and the ash-heap left, allowing a margin for inevitable loss. What was the good of all the toil that straw took to net nourishment from the air, if it was to be so wantonly sacrificed after all? It was no encouragement to an industrious plant, and assuredly something like waste on the part of the owner. Scarcely equal in agricultural merit was it to the small farmer's dodge of strewing loads of straw in wet lanes to rot, as though water were the main requisite in manure.

At the same time, burning fern or stubble on the surface of land, from the action of fire, has been considered "one of the most powerful manures that can be used" (*Young*), as Virgil wrote so many long centuries before the Conquest:

> "Sæpe etiam steriles incendere profuit agros,
> Atque levem stipulam crepitantibus urere flammis."

Arthur Young informs us, further, that sometimes four tons an acre were spread over the fallow and fired. The benefit was considered to arise from the heat and not from the ashes. Throughout Gascony and Bayonne he noticed the "practice of manuring for raves, a sort of turnip," was with the ashes of burnt straw. "The fields were black with it." He, again, who rides by the Welsh mountain-side, will not fail to have observed how revivified with fresh

green has become the site of the gorse bushes which attracted attention from the drawing-room window by their blaze ten nights before, as he was held in envied converse with the county belle. An emerald delicious patch is it which the lamb nibbles gladly, an oasis amidst the surrounding coarse grey carpet of innutritious grass, which had done its utmost in affording him a soft lair.

You must put one thing against another. You must swallow your share of flies, only do your best not to have the bushelful at once, as the legendary waiter would have had the traveller take it, but in a commixture ordinarily mortal.

Do as much as you can by job-work. It will save you much unnecessary anxiety. Even the best of men are apt to flag when they see the long hours before them day after day, and the same invariable pecuniary reward; whereas a man working by job has an incentive, something of additional inevitable encouragement. Don't blame him, it would be so with us all, even if we should lose occasionally thereby. Without hope, what were life? The painter's rule was "*Nulla dies sine lineâ:*" the provident old gentleman carried acorns in his pocket, depositing a certain number daily to his heir's advantage. Thus, young friend, do you make a rule of doing an extra small bit of duty of some sort daily. You need not cast about far; you are sure to have some small jobs on hand that will supply the opportunity when the regular daily duty's done. Just make an effort and cram in another boot or so; you remember how we packed our portmanteau at college: or just stand up as the

schoolboy did, and you may rely upon it you can always store away another layer. All this is so much gain—gilding, fringe, custard, or what you will; advancing you steadily, though almost insensibly, upon the slips, beside increasing your daily satisfaction. How those atoms run up, too! You will be suprised to review them a year hence with their compound interest increase.

Festina lentè.—Whatever you may set your heart upon, be never in a hurry. There is always a simpler plan, you may depend upon it, than the one which first presents itself. Simplicity is the result of time and thought. Patience, and you will unravel the reel. Be hasty, and you lose not your temper only but your opportunity. Never adopt the first plan you think of any more than give way to the first aspect of difficulty. There is always a way out if you bide your time.

In agricultural, as in military operations, the rule prevails, *make safe the line behind you.* This moment, as I write, I have an illustration of it. A few days since, after many weeks' heavy rain, we had suddenly the apparent promise of settled weather. Wheat-cutting commenced at once, and was diligently carried on. Our machine enabled us to have a field down in a few hours; being clean and ripe we carried it next day, taking the precaution, however, to put it into two stacks instead of one as usual. It was at once thatched over, all the stray straw in the stack-yard was heaped up into a conical form, and things made "taut." This morning, with a rising glass, there is, notwithstanding, rain.

We all know what it is to play a trick upon ourselves, after the example of the toper elsewhere referred to, who added an extra half wine-glass of water daily to his tipple, until it was water and nothing but water; and he relished it, and had, moreover, a new lease of life. It is as well now and then to play a trick upon your men. I have found it useful to have a stack or two of hay at a distance from home.

It is astonishing what a difference it makes in the winter's consumption. The horse and cowmen will not always be drafting off when they have to carry their load farther. Set all the ricks beside the homestead, and, despite your best attention, they will vanish somehow sooner than they should. It is such easy feeding to cram the rack with hay.

Demand.—The call for articles on the flags of the agricultural exchange varies; to-day, colts; to-morrow, corn; this market morning the butchers pressing over each other to offer for your bullocks; next week, cruising coyly by, although the self-same stock is shown for less money; oats have come in; the London dealers report an impendent abundance of hay; short supplies of keep still drive the farmer to thin; so the market is glutted and the butchers indifferent. Never mind, however, if your things be good and repay the feeding, but

> "Bide ye yet, and bide ye yet,
> Ye dinna ken what may betide ye yet,
> Some bonnie wee picking may fa' to your lot,
> And ye may go daft with thinking o't."

I need scarcely say that the farmer should be up

early in the fresh morning, or the servants will soon be drowsy. The order of operations given, when a saunter has been taken around the stock, the day's neck is broken, and he can sit down in his study after breakfast to read or write. Good is it, put it down as gain, if your study overlook the land, as your dressing-room should the stable-yard: the idea of your eye being upon them will keep the men brisk, and you may so often steal a march unawares, without the work suffering; you can take your fishing-rod, or a gallop with the hounds, or amuse yourself as you please. If the farmer's business be not over lucrative, it certainly gives most opportunities of any for well-regulated pleasures, and is proportionately free from anxieties.

In agricultural chess-play you cannot always rely on the same style of move. The seasons are a crafty antagonist; you are checkmated often when you have least reason to expect it. Judge deliberately, shrewdly as you may, you cannot always be in the right box; see, for instance, how effectually the usually true adage, "Down corn down horn," has been countered this last spring. Regard this anomalous year. Meat high, because, owing to the rot, the farmers were obliged to press their flocks into the market, when the butchers would, consequently, give a good price only for the best; while store cattle were dirt cheap, owing to the turnip crops having been a failure. Then, cruelly enough, this very turnip crop is a failure, because, acting on the instructions of the seedsmen, who spoke from their

last season's experience that none sown before June did well, suffering from mildew, &c., we put them in too late. The natives said so, but we were grand, and quoted high authority. (N. B. It does not do to neglect the accumulated observations of old intelligent neighbours.) Then, again, the cow I bought as a foster-nurse for young May Duke, I kept apart, in order to sell as a dry cow. Store stock went down, and she ate her head off in attempting to fatten; whereas, had she been again in calf, she would, at least, have paid. Last year, I failed to sell a maternity of like description, as she happened to be in calf, when they wanted a barrener.

Weather.—Bad cess to the fellow who feels not jolly on a bright frosty morning. The thing is to keep up your spirits when the landscape is wrapt in our English robe—"humid, but healthy," as the geographer will have it. To be hopeful and go ahead on a damp November morning, that is the question, when

> "The soul of man dies in him loathing life,
> And black with more than melancholy views."

I know no occasion on which the presence of the master is required more than upon one of these suicidal days, as our lively neighbours across Channel term them; these days when everything goes wrong, when the bailiff is bothered and the ploughman grunts about the mildewed hay; when the pattern milker kicks the pail over, or tints its contents by a plunge of her hoof; when the dairy pans are smashed, and the chaff-cutter goes whirr with a disjointed cog-

wheel; when the Alderney gets chilled, and the ten-guinea prize sow makes a breakfast of her litter, or, castor-oiled an hour before, steals a wallow in the horsepond; when the game-cock has pecked out the white guinea-fowl's eye, and the wheat-stack is growing through the thatch; when the show pony's hock swells, and a favourite ewe dies strangled in a hurdle; when the bloater smells at breakfast, and at dinner the apple dumpling's smoked; when the income tax collector comes playfully a month before his time, and your precious chesnut three-year old goes lolloping over a meadow of open drains with a gate around his neck, wherewith he has managed to collar himself, suffering as ourselves from the ennui of the hour. Then to brighten anew with the carbonic acid gas of your personal inspiration the flat waters of your dependents' duties. Ay, that's the rub! The great thing for yourself is always to have a pleasant thought handy. Store a few in the waistcoat-pocket of your memory, and when you are worn down by the untowardness of killing circumstances and the grumbling of Job's comforters down to the last pitch of endurance, then pick one of them out, 'and therewith straightway heal your sorrows. By the way, a capital remedy for rage is said to be to fill your mouth with comfits; what with the delightful taste and the fear of spluttering them out, a person is found to smooth down speedily. To revert, however; you are no worse off than your neighbours, depend upon it, though you are too apt to think so in these moments of temporary depression. Forget not that man is affected as brute animals by

weather; that as the duck is consternated and waltzes involuntarily across the pool in thunder, as the pimpernel closes and the dog sleeps on the hearth-rug before rain, as the harp-strings relax and the mercury goes down, so do the spirits of immortal man. Now is the time for the master to be here and there and everywhere; to keep the craft forging on her headway resolutely, despite depression and despondency of self or men. And when the sun breaks out again it is surprising what way you will be found to have made; for it is not every one who moves at all during this stagnation of nature, so that whatever progress you have made will, probably, be in advance of your neighbours. By way of occupation for this sort of weather, and when the rain pours down too heavy for the men to stand out, have them into the outhouses, or barn, to sharpen tools, fit handles, weave thatch, look the harness over and oil it, grease wheels, paint implements, &c. Under a dry shed it is well always to have a bushel of lime in reserve for whitewashing, which also may be done within doors during a season of this sort; otherwise you cannot fetch it when you want it. Lime is always useful in some respect or other.

When the torrent slackens, clean out the boxes, carting away the manure at once to the land, or heap under a wall of northern aspect, where the sun's rays never strike. Under cover it is best for you to part your men as widely as you can; fix them in small working gangs, and be among them as much as possible with your book or tool-box; for one chatterer will cause an infinity of idleness. By

reading to them from some interesting volume you may improve their minds while you amuse their occupation.

This reminds me how much the village clergy might do for the cause of agriculture if, three days a week or so, they were to have out the school children for an hour or two in the fields, under the superintendence of a skilled but superannuated labourer, to teach them hoeing and the like well. It should be made part of the condition upon which the children are allowed to attend the school, or some silly parents might object. This system, properly pursued, would prevent their running off the rails, as so many do when their period of study is ended. The moulting season between school and active life is always a weak one. But if a child be treated reasonably, be allowed fair freedom while under control, at the same time that he has had pointed out to him until he realises it the universal obligation to labour, and the wisdom of taking play and work by thorough turns, there is very little risk of his resulting badly in the village any more than in the university. The plan has been adopted with success on the estates of some of our enterprising noblemen, who have beside their hearts the interest of their people. What an inestimable blessing a well-conducted national school is, while an indifferently-managed one is worse than none at all!

Water.—For the following I trust useful information respecting this inestimable essential, needed alike in the farm-yard trough, the dishes of the poultry-yard, and upon the dinner-table of the

family, I am indebted to a most able article in *Muspratt's Chemical Dictionary*, to which I recommend my reader to have direct recourse, as I have been confined, both by time and space, to the merest rough notes..

"Pure water has neither taste nor smell, and is of a greenish hue when seen in large masses.

"Rain water is a very powerful solvent of certain ingredients of the soil, such as sulphate of lime, chloride of sodium, and magnesian salts: but when saturated with carbonic acid its solvent properties are remarkably increased.

"Certain of the mineral constituents impart to water its hardness. These are the salts of lime and magnesia. Hardness of water means the power it has of decomposing soap.

"The sulphates, chlorides, and nitrates of lime and magnesia give to the water the so-called *permanent* hardness, while the carbonates, which are held in solution by excess of carbonic acid, impart to it *temporary* hardness, or that which it loses by boiling."

The mineral constituents of water are "decidedly more beneficial than injurious," so long as the proportion does not exceed thirty grains per gallon. The sense of taste is the best guide in this.

As regards the purification of foul water, he writes, amidst other most interesting details, that "Thames water, if allowed to stand in an open vessel for a few days in warm weather, acquires a very offensive odour, arising from the decomposition of the animal and vegetable matter which it holds in solution.

This water, notwithstanding, is considered by maritime authorities to be the very best for ships' companies. On board ship the water is stored in wooden casks, which are placed low in the hold. During the first week or fortnight, according to the temperature of the atmosphere, the water ferments, evolves a quantity of gas of offensive odour, and deposits a copious brown sediment. The water gradually ceases to smell badly, becomes bright and sparkling, and will then keep fresh and sweet for an indefinite length of time. In other words, it loses by a natural process of decay the whole of its putrescent impurities. In vessels of war, and in most of the large steamers, tanks of iron have been substituted for casks of wood for storing the water necessary for the use of the passengers and ships' company. In iron tanks, Thames water evolves no offensive gases, but becomes much purer than when stored in wood, and deposits a more copious brown sediment, which turns red on exposure to the air. The gases produced in the wooden casks are said to be slightly luminous in the dark, and to explode when a lighted candle is placed near the bunghole when the plug is removed. The luminosity is due to phosphide of hydrogen, and the explosive character of the gases to carbide of hydrogen. It has been proved by numerous trials with Thames water, sewage, and water artificially contaminated by mixing therewith sulphide of hydrogen, sulphide of ammonium, and urine, that, however impure a water may be, it can be rendered perfectly pure and wholesome to drink by merely allowing it to remain in

contact with a large surface of metallic iron for twelve or twenty-four hours, and then filtering through well-washed sand; or, better still, through a mixture of about one part animal charcoal and four parts sand."

It happening, on one occasion, that the water conveyed into Amsterdam became unfit for use—it was purified by means of iron. "It may be observed, that Amsterdam is supplied with water from the Dunes —sand-hills—in the neighbourhood of Haarlem. Trenches five miles in length have been dug in the sides of the hills, to interrupt the rain-fall. The water is conveyed to a large reservoir, whence it flows to the filter-beds at the works, and is there filtered through four feet of filtering medium, consisting of pebbles, shells, and fine sand. After filtration it is pumped up an iron stand-pipe 150 feet high, and conveyed by iron mains to Amsterdam, a distance of eighteen miles."

The water, however, becoming nauseous, application was made for the chemist's aid, and a regular inspection took place. "As anticipated, the Dune canals were found to be actually choked up with aquatic plants, and at the side, and wherever the current was sluggish, were large masses of dead algæ floating on the surface. The sand at the bottom, originally very white and pure, was blackened to some depth by decaying vegetal matter, and when disturbed numerous bubbles of fetid marsh-gas escaped. A thick slimy deposit made the water unwholesome."

Induced by experimental results, which need not

be further referred to here, Medlock immersed a coil of iron wire in a vessel of the supplied water, and which to the eye was bright and clear, and free from the slightest chalybeate taste, but after standing some time used to deposit a reddish-brown sediment, which coated any vessels it was put into. In five minutes a faint white cloud was seen radiating from the coil of wire and descending in the form of a parachute. In half an hour the cloud had increased in density, and the water became opalescent. In six hours the cloud was brownish, and there was a brown deposit in the bottle. In forty-eight hours there was a red deposit. The following are analyses of the water before and after it was in contact with iron:

WATER FROM THE DUNE CANALS

	Contained	
	In its original state.	After having been 48 hours in contact with iron.
	Grains per gallon.	Grains per gallon.
Sulphate of lime	3·70	3·68
Chloride of sodium	4·10	4·01
Carbonate of lime	5·60	3·20
Carbonate of magnesia	3·97	1·30
Silica	0·16	Trace.
Iron, alumina, and phosphates	0·95	Trace.
Matter volatile on ignition, and called organic matter	2·10	Trace.
	20·58	12·19

From these analyses it is seen that 2.10 grains of organic matter, contained in the water, were decomposed or thrown down by contact with iron. The water, thus purified, no longer had the unpleasant

fish-like taste and smell which had marked its previous contamination. This was the first occasion on which iron was tried. The experiments with the Thames water, &c., were subsequent. The plain inference from this is, that where cisterns are required it is best they should be made of iron. I have several, bought at a most reasonable rate from Burney and Bellamy, Millwall, London, who supply them of any size at about 25*s.* the hundred gallons. The larger they are the cheaper they come. They are light, moveable, and altogether extremely handy for any purpose.

Powdered alum, in the proportion of three grains to a quart of water, will purify water. This process (*alunage de l'eau*), when practised on the Seine water, Arago states, will immediately cause the mud to agglomerate in long thick striæ, which are very quickly deposited. "The theory of the process appears to be this: The alum decomposes the bicarbonate of lime, and gives rise to the formation of sulphate of lime, which, with sulphate of potassia, remains in solution, while carbonic acid is evolved, and hydrate of alumina being precipitated in a flocculent form, carries with it various mechanical impurities. It by no means follows in all cases, perhaps not even in the majority, that the purest water is the best for the health of a given family, or the population of a given district. The bright, sparkling, hard waters which gush out in frequent springs from the chalk and other limestone rocks, are relished to drink, not merely because they are grateful to the eye, but because there is something

exhilarating in the excess of carbonic acid they contain, and give off as they pass through the warm mouth and throat; and because the lime they hold in solution neutralises or counteracts acid matter in the stomach, and thus acts as a grateful medicine to the system. The best filter is no substitute for bad water."

Some waters are longer than others in settling after disturbance. A bottle filled from the flooded Garonne will continue muddy a fortnight. "Depuration is greatly assisted by repose."

Though not required of necessity here, it may interest a few, as it interested myself, to peruse the following table (which I borrow from Dr. Muspratt), showing the comparative purity of different waters which are used to supply towns in England, Scotland, France, &c. It is drawn up in round numbers, each degree being equal to one grain per gallon.

		Degrees.
Impurity of	distilled water	·0
,,	Loch Katrine, ditto	2·0
,,	Dee, Aberdeen	4·0
,,	Tay, Perth	5·5
,,	Dumfries	7·0
,,	Gorbals	8·0
,,	Leven	8·5
,,	Clyde	9·5
,,	Tyne, Newcastle	11·0
,,	Tweed, Coldstream	11·5
,,	Seine, Paris	12·0
,,	Liverpool, purest well	13·0
,,	Glasgow	15·0
,,	Kilmarnock	15·0
,,	Thames, 1854	15·5
,,	Thames, 1851	21·0
,,	Glasgow well, most impure	96·0
,,	Liverpool well, ditto	417·0

The following table I append, as showing the influence the strata through which a river runs have upon its water. The Dee and Don flow from primitive rock formations. The Trent through a selenitic district. The Thames over a chalk formation.

	Thames.	Trent.	Dee.	Don.
	Degrees.	Degrees.	Degrees.	Degrees.
Carbonate of lime . . .	10·80	0·32	0·85	2·23
Sulphate of lime . .	3·00	21·55	0·12	0·13
Nitrate of lime . . .	0·17	—	—	—
Carbonate of magnesia .	7·25	5·66	0·36	1·07
Chloride of sodium . .	1·80	17·63	0·72	1·26
Silica	0·56	0·72	0·14	0·52
Iron, alumina . . .	0·27	0·50	0·06	0·27
Phosphate of lime . .	Trace.	Trace.	Trace.	Trace.
Organic matter . . .	2·36	3·68	1·64	3·06
	20·21	50·06	3·89	8·54
Hardness . .	14·00	36·50	1·50	3·00

Great care should be taken to keep the *pools* regularly emptied and repaired on farms where water in summer is scarce. Emphatically I direct this—considering how foul such watering-places are allowed to become by a careless tenant, either from carrion being thrown in, or from the fall of decayed leaves (especially the deleterious leaf of the ash-tree), from the cattle standing and scouring in them, or from the yard-drainage having an outlet into them —as a matter of no mean import. Many are the disorders of cattle and horses which arise from their being allowed to drink at pools of this description, Farmers often argue that their cattle and horses *prefer* such a mixture to the clearest river or pond

water: in fact, because it is grateful to their stomachs, disordered by bad food and treatment; just as you will often see a horse eat soil at the hedge-side. Change their food, put rock-salt in the manger, and, if necessary, give medicine. You will no longer find that they prefer to fill themselves at the pool on the lowest side of the farm-yard, into which the dung juice drains. The poultry-fancier knows that on the purity of the water supplied to them depend the health and plumage of his stock. It is as well that farmers, too, should know that staring coats and broken wind are the certain ultimate consequences of allowing their teams to drink such turbid stuff. At the bottom of foul pools, besides many other noxious reptiles, there accumulate the larvæ of a large species of beetle, which, swallowed by the drinking animal, are productive of the worst results, causing them to void blood, and greatly reducing them in flesh and strength, if indeed they recover at all.

Soils.—Of soils there are all sorts, and happy is he whose farm combines a variety—clay for the wheat and mangold, a dry loam for the barley, a lime earth for the peas, &c. &c.; but gravel, hungry gravel, entreat not for! A most prodigal relative it is—the more there is given it the more it drinks, and with the less benefit to itself and donor. Sand or gravel, with a veneer of rich mould upon it, produces a forward sweet grass, which, though subject to burn, yet quickly recovers with the least sprinkling of rain. An empiric indication of good land is that it grows large trees, blackthorns, rank grass, luxuriant weeds,

especially the thistle. Deep sheltered bottoms open to the south and east are usually most fertile.

From the gem-enfolding alluvial deposit of Ceylon, in excavating which the visitor in search of restored health may disport himself amidst the miniature diggings throughout the valley of Neurra Ellia,—from the deep decayed vegetable cake that wraps so much of Northern Hindustan and constitutes the vast wheat-growing bed of South and Central Russia,—to the sour black mould that will do nothing until tapped, then requiring, too, quick-lime to start its activity, and the infirm soil that overlays the surface of the iron lode, there is a vast variety of earths, classified by the scientific into "argillaceous or clayey, silicious or sandy, calcareous, loamy, gravelly, and peat or moss," to one or other of which may be ultimately referred all varieties of soil within the British isles. (*Donaldson's Soils and Manures.*) Nay, literally, now-a-days, you may almost compound a soil to suit you; but then you may buy gold too dear. It is better to take what nature gives you, subject to scientific and generous improvement, than lay out the fortune of your heirs in the building of a wild manufactory.

Still, it will pay you to take up some easy treatise on geology, and inhale some notions of each soil's respective value—what vegetable it best suits, &c. The above-mentioned work is an excellent one of the sort.

Sufficient chemistry, too, you may soon attain to test the soils, water, &c., on your land; an invaluable ability, as you can then suit the nutriment to the need.

In calculating the value of land in this country I am told by an eminent agent that for every twenty feet of rise above the nearest water he deducts 3 per cent. from the rent in consideration of low temperature. The western aspect of land he states to be always the worst, if not within twenty feet of the water. Land that faces the south-east is best. Where rivers run eastwards the land is always good: where they run westwards, poor. Clay or chalk is the more valuable for being dug from south or western hills than from east or north. Northern hills, when wet, should be drained up and down. South-western hills, if wet, should be drained obliquely.

Variety of Crops.—The plan of growing a bit of all sorts, which the tyro begins with (perhaps wisely), he will scarcely continue—corn, cow-cabbage, linseed, lucerne, vetches, clover, sainfoin, parsley, parsnips, carrots, gorse, turnips, mangold-wurzel, oats, barley, holcus saccharatus, chicory, and meadow hay,—all in the same season, and on a small farm. As I write, I am reminded of the country between Wiesbaden and Heidelberg, where I remember, just ten years ago, to have counted growing (besides orchards of apple, pear, and cherry-trees, &c.) the following different crops, which merely amused my eye—then not interesting me in an agricultural point of view—wheat, rye, barley, oats, potatoes, onions, melons, peas, kidney-beans, lucerne, Indian-corn, poppies, flax, cabbages, lettuces, beetroot, hops, raspberries, clover, lupines, vetches, strawberries, currants, turnips, tobacco. The plan has its merits, but they are overlaid by an infinity of trouble attaching to the

first preparation of the soil, the season, the sowing, the succession, the weeding, the harvesting. The foreigner, however, can keep his head clear through a fractional apportionment of his land, that would distract the ordinary English husbandman. Berkshire might perhaps compete with the best chance for the honour of comprehending it. A considerable and even breadth of each crop is what you will come to. Eventually you will grow for your own consumption, and consume all you grow; so you will give marrow to the bones of your land while you sell off only meat. He pays out the heart who sells the cereals, and either feeds not with bought stuffs to replace the drain, or gives instead artificial manure. Well, but if everybody consumes and nobody sells? Ay, ay! that's the old fallacy; why everybody won't. You might as well say, what if it rains always, and never clears up; and if they did do so in this country there are other countries that can supply us cheaper and better than we can ourselves.

Succession of Crops.—The following simple table, of exceeding value to the youthful farmer, is the sedimentary result of the practice, thought, and reading for years of a distinguished agriculturist, of whom England may be proud, and who has kindly placed it at my service.

1. Narrow-leaved Plants.	2. Broad-leaved Plants.	3. Oval-leaved Plants.
Wheat.	Turnips.	Saintfoin.
Barley.	Swedes.	Tares.
Oats.	Beans.	Trefoil.
Rye.	Peas.	Mangold.
Rye-grass.	Clover.	Carrots.

Casting your eye down each column, you read the names of plants which can never, with full advantage, be set to follow each other on the same ground; *e. g.* take Table 1. Barley should not follow wheat, &c.; 2, beans should never follow swedes, &c. Casting your eye across the table, any combination of the crops of two of the columns will excellently prepare the soil for the production of the crops named in the third table: *e. g.* take Tables 1 and 2, barley and swedes, consumed together, or oats and turnips, or in fact any combination for feeding purposes you please (and the greater the variety used the more your stock will thrive in the consumption) of produce named in Tables 1 and 2, will capitally prepare the soil for the growth of any crop mentioned in Table 3. Again, 2 and 3 fed in combination prepare for 1, or 1 and 3 prepare for 2.

This sea-girt land is pre-eminently a breeding station; what with the climate, the inherited elements, the prestige, the enterprise, as yet our horses and cattle are unrivalled; and if the foreigner will come continually, so that there is, despite all cornices sinistræ, a regular tide set outwards, why then we should be foolish to grow that which fetches only a comparatively fixed price, when for the other produce (stock), prices not only fancy, but almost fabulous, may be obtained.

An experiment plot is a useful appendage to a farm. It should be near the house and always well locked. Here you can try any new seed that may come into your hand by gift or purchase; and test any greatly recommended crop before you venture

upon its cultivation too largely. It should not be richer than the rest of the farm; and a regular minute register should be kept of the experiments and the result. *Ready, aye ready,* should be the motto of the husbandman. What a thing it is to catch the season. It is everything. To have your last load of mangold-wurzel just carted in and covered when the rain begins to fall; and that dark cloud's flow is succeeded by a frost, a killing frost. Heigho! for the roots that are out.

"A wet-lead hand and a bright look out," that's just what you want, my friend, in farming. There is always something effective to be done if you hit the right moment. I have just returned from a two hours' afternoon inspection which has been worth a ten-pound note to me. All day it has been pouring a hopeless continual torrent, drowning and damping every animal and thing. Moodily the men wrought mechanically at their daily task; the cattle stood drenched, helplessly giving a back to the pitiless storm; desponding and wretched, chanticleer had taken up a spiritless and ignoble position under the waggon. Something, however, must be done. A stream is pouring down the roadside, tinted, I sorrow to see, by a porter-coloured rivulet from the stable-midden, which it is impossible to stop without removing the whole heap.

It is worth while, then, just striking a hole through the fence with crowbar and spade, and so extemporising a sort of water meadow. The exertion enlivens; the juices of the system, I presume, get clear of their stagnation. So having completed that task, I wander

farther with the spade upon my shoulder. It occurs to me that I will go and see whether the new drains at the bottom of the farm are drawing well. On my return I happen to cross a meadow covered with the coarse innutritious carnation grass, which, drained years ago by the last tenant, it is clear must be doctored again when we have leisure, but when will that be, and precious time is passing. The water stands in pools along the hollows which mark the line of drainage. Half mechanically I strike down the spade and cut out a spit of sod, with no other effect but to find the subsoil a tenacious clay, and to see the muddy fluid collect contemptuously in the hole. It occurs to me that I will just try what sort of drains they were; whether stone, or stick, or pipe. Down goes the spade again; another spit; a shake round of the soil, and bubble, gurgle, away bolts the rain-pool as if shot. Hurrah! there is a drain below that draws. I run home and fetch the crowbar and try along the line, everywhere with the same result. I fetch the gardener, a practised Devonshire drainer, who is amused and quite struck with the new idea of draining by a crowbar. Here it is, however. The drains are all good enough, but the clay above has got so trampled down and hard that the water does not penetrate it. I have a plough then run along them, just peeling off a thin slice of turf to allow the water a free course. A hole is struck down about every two perches, widened by the crowbar, and filled with broken stone. The drains then continue to act as capitally as the first day they were made. Now this very field was condemned as incurable,

unless redone, by a regular drainer who made a solitary inspection of it some years since. It was consequently reserved for future tapping when the ship came in. A lucky idea, then, was my wishing to see the pools run off.

FENCING.

If you take to making fences, it may be as well to know something roughly of the woods usually adopted for the purpose.

First, we take the *whitethorn*, which will suit any soil except a dry gravel, and even that in a wet year. It is raised from seeds or plants, but plants are the quickest way; the seeds lying two years in the ground before they spring, though they grow fast after two or three years. Haws put in a hair-bag and soaked in water all winter, then sown in February or March, will come up first year, and grow better so than any other way. Where sets are scarce, when you fell your underwood, or rather the year before, sow haws and sloes, and you will get lots of plants. The root of whitethorn makes capital boxes and combs. Many being finely veined when they attain to size, are valuable to turners and cabinet-makers. This might amuse as well as pay the owner of many a rugged property, which, now given up to the rabbit, the pheasant, and the brood mare pony, might be so made to yield a better profit. Sir James Graham, with characteristic intelligence, has the small wood on his estate, which "used formerly to be burnt to get it out of the way," cut up into

bobbins for the Manchester thread-manufacturers. "For this purpose beech, hazel, alder, birch, and ash coppice are all suitable, and are now sold where the trade is fully established at 1*s.* per cubic foot. At a sale lately in that district, a coppice of this description brought 30*l.* an acre, free of all expense of labour to the owner of the land, and in about fourteen years more the same coppice will be again ready to cut." (*Caird's English Agriculture*, 1850, 1851.)

Blackthorn is apt to run into the ground and is not so certain of growing, but the bushes are best adapted and more lasting to mend dead fences with; cattle don't crop it so much. It grows in the same soil as the whitethorn, but the richer the mould the better it thrives. Some interplant, but not too thickly, privet; with a view at once to the relief that evergreen gives the eye in winter, and the shelter it affords when other bushes are stripped bare.

Holly is slow to start, but makes amends when once up by its thickness, strength, height and chevaux-de-frise character. Plant in a moist season, autumn or spring, and shade with haulm or straw till they begin to sprout. If any seem to perish, cut them close to the soil, and they will spring from the very ground.

The Furze, too—for the sight of a sea of whose golden blossoms upon an English common Linnæus fell thankful on his knees—when trained, makes an excellent fence. It is apt to grow thin at the bottom, the lower spines withering and falling off with the growth of the bush, which reserves its verdure for a

crown. Hence has it long been used as a cover for the fox, or a verandah to the rabbit-burrows. It has been used lately, chopped and bruised, as food for horses. It requires the admixture of salt, or it will bring off their hair.

Spruce.—In Norfolk and Suffolk the spruce and Scotch firs are much used upon the poor, exposed, soils, as a fence for boundary and shelter purposes. They are planted of about four years' growth from the nurseries, ten inches apart. They form a singularly handsome fence, impassable by any animal, ever-green and thick. The foliage is trimmed upwards on both sides, as a steep-pitched roof, so that a cross section is acutely triangular, the object being to allow of the snow's slipping off, instead of lodging, to the certain down-weighting and breakage of the boughs.

For garden partition, the dwarfed elm makes an elegant and close fence, as does the beech too, which moreover has the further claim upon our consideration that it always looks clothed, the old brown leaves adhering until gently supplanted by the new. Of the laurel, yew, espalier-fruit-trees, &c., I need not write. The nurseryman, now-a-days, prints in his circular directions so clear, that you will not have the difficulty in acquainting yourself with your need, or of supplying it when known, that the shrewd old Mortimer and his associates had.

Many landowners have a practice of pulling down the fences as they join estate to estate by purchase, substituting for them iron railing. In this case sheds have to be built for shelter, or the stock would

assuredly suffer from being exposed to the accumulated force of the sweeping blast across the open.

SEED.

Should you have turnip or other seeds left from a previous year, don't be too ready to throw them away; try them in a flower-pot or a hotbed, or on damped flannel in a sunny window. They retain their vitality far longer than some would have you think. Not to quote the case of the grain found after thousands of years' immurement in the Egyptian Pyramids, you may prove it for yourself if you pick out an uncultivated rough spot that looks like a remnant of old days, and then turn up the deep soil, and allow what seeds are imbedded therein to vegetate. White mentions a patch of cleared forest near Selbourne, which became "covered with thistles of various kinds. The seeds of these thistles may have lain probably under the thick shade of the beeches for many years, but could not vegetate till the sun and air were admitted. When old beech-trees are cleared away, the naked ground in a year or two becomes covered with strawberry plants, the seeds of which must have lain in the ground for an age at least. One of the 'slidders' or trenches down the middle of the Hanger, close covered with lofty beeches near a century old, is still called 'Strawberry slidder,' though no strawberries have grown there in the memory of man. That sort of fruit did once no doubt abound there, and will again when the obstruction is removed." Flowers frequently reappear in a

garden after having been for years missing; the fact being due probably to an accidental deep digging. Mortimer conversely mentions that a natural growth of wild thyme, betony, wild strawberry, indicates the soil to be fitted for wood. With regard to this sudden apparition of strange vegetable growth, it is a singular fact that whenever any fire has occurred, white clover will ultimately spring up on the site; and the plaguy coltsfoot will assuredly follow a top-dressing of clay marl. Wherever fern grows the swede will, as Mr. R. Smith once remarked of his native wilds, and as the summer tourist to pleasant Llandudno may see with his own eyes beside the railway.

The exact duration of the vitality of seeds kept above ground in the ordinary way as given in the *Farmer's Reason Why*, being the result of a series of interesting experiments made by Messrs. Fraser and Co., 82, Bishopsgate-street, is as follows. I give farm seeds only, but commend the whole book to your reading:

The Brassica Tribe, as cabbage, kale, turnip, rape, &c., if well ripened and harvested, will retain a growth of 90 to 100 per cent. unimpaired for from four to six years; then for a year or two diminish from 10 to 20 per cent. per annum; and, generally speaking, at the end of ten or twelve years, the vital power is almost exhausted.

Carrot and Parsnip, much affected by season, scarcely ever grows more than 70 or 80 per cent., and this only for one or two years at most. Three-year-old seed will rarely grow more than 10 or 20 per cent.

Peas (garden) being all hand-picked, should grow 100 per cent. They will grow equally well a second or even a third year, but germinate slower. After third year, of no use for seed.

Beans will grow 100 per cent. first year, if a good sample; after first year change colour, and lose their germinating power to the extent of nearly 50 per cent.

Beet and Mangold-wurzel, equally good as seed from one to seven years; they have been known to grow well ten years. Each seed contains from two to four kernels, protected by a hard, rough, woody-like coating; each kernel, if perfect, will produce a plant. Thus, 100 seeds often yield a growth of 200 to 300 per cent.

Lettuce, Parsley, and White Clover, grow 80 to 90 per cent. first year; lose 10 to 15 per cent. the second; the third still more; and at end of fourth year, scarcely germinate.

Red Clover grows rather better than white, and retains vitality a year or two longer.

Grass Seeds, excepting rye-grass, will scarcely vegetate a second year.

Labourers vary exceedingly; some are as good as gold, some worthless as a puff-ball. Some ever willing, some ever grumbling. It is easy to say which to have if you can, and you will soon have your choice if you approve yourself a good master. Your place will be no sooner vacant, than there will be an ample array of candidates for it. Still, the best men are comparatively machinery. They lean so much upon

the master for orders, for inspiration, for help. Perhaps 'tis better so, though I think I have read that the French soldier who challenges every command of his officer, is reckoned by authorities superior to the puppet of a less vivacious parade-ground. A few hints for the tyro's guidance I jot down as they occur to memory.

You must not rely upon your ordinary labourers, even the best of them, in the case of any difficult circumstances occurring: any sudden unusual illness amidst the stock, any change of orders being required in the fields. Happy if you have a bailiff with the head and inclination to take your part. If your men were equal to any emergency, remember they would be no longer farming men, but would take in due course a higher position—whereas as upon the stage there are subordinates as well as leading actors and managers required. A terrible fatalist is the labourer, should anything go wrong; it is no libel to write of too many of this class as Virgil did of the shepherd of his day:

> "Dum medicas adhibere manus ad vulnera pastor
> Abnegat, et meliora Deos sedet omina poscens."

Anything that goes wrong is prone to swell in the sight of the indolent rustics; their apprehension magnifies as the fog upon the Hartz Mountains. They look out, too, for trouble. It seems with too many their pleasure to try to perplex their master, as though their private enjoyment gained lustre by the foil of their superior's trouble. Especially provoking are some in this line. No anxiety

has he about the falling funds, or thousands sunk in a consumptive railway. Surely as he sits so apathetically upon the village green of a summer evening, blowing unfragrant clouds, and holding a kind of converse with his fellows of the bucolic race generally, may one not unfairly select for him a fitting motto in the Athenian's language?

ἐν τῷ φρονεῖν γὰρ μηδὲν ἥδιστος βίος.

It is a class that certainly wants improving sadly. The village clergy might do much towards it.

Those difficulties, which in a master's presence go down like clods upon a turnip fallow beneath a Crosskill after light rain, too often break the labourer's weary heart. No matter what your distress, they will reply indifferently and go stolidly about their work; some glorious exceptions there are, certainly, I must allow with thankfulness. Let me counsel you not to allow the same pair to work always together, you cannot judge of their relative powers so well. Challenge the least semblance of a difficulty. Avoid changing a man between meals from one task to another, which beginners are very apt to do. There is much time lost in the shunting, and they do not settle at once to their work. Don't cross your men in their work, nor set one over another. They are very prone to jealousy, and you will have a quarrel to arrange. A clever good lad upon a farm is worth his weight in gold. Let him tend a few pet things—calves, colts, &c., for you, and he will soon learn to be popping in and out; finding the cow just calving in the field, which your herds-

man had forgotten; remembering for others and reminding; handy to fetch anything, quick for a message, pleasant to teach. Of this kind came Culshaw, whose skill in the management of shorthorns has now a world-wide reputation. Of a clever, or rather crafty, town lad, beware; he has been too much about the inn; he is too ready with his tongue, his fingers, and his pipe. The lad you want must be of good material, and you must mould him yourself. Teach him gradually the management of every kind of stock, and the use of every implement. If he be grateful and good, he will grow under your hand to be an inestimable bailiff in time — a calm, clear-headed, resolute leader, in contrast to so many who bother more than direct the men, ever skipping about without effect or use, as fussy as a sitting duck. Acquaint yourself as soon as possible with the peculiar distinctive talents of each man. A turn for the interpretation of physiognomy pays. One will lay a fence best; another loves horses; another sheep; another is a quarryman and drainer, &c. The very way in which one will catch and direct the falling corn upon your reaping machine, will indicate to you who has brains and who not. All men who have charge of stock will want especial looking after with respect to the consumption of hay. You may desire them to cut chaff, hay and straw together, but unless you keep an exceedingly bright look-out there will always be a surplusage of uncut hay which they will give on the sly, despite you and your bailiff. You can detect it only occasionally, from what the horses throw down and trample. They cannot be

taught that they have no right to improve the allowance of their teams, if they can manage to do so by hook or by crook. It is a good plan to give each set of men a stack of hay of their own; noting in your memorandum-book the first day they cut it. Each, then, must bear his own blame for the too rapid disappearance of the farmer's most precious store; disappear it will, most assuredly, unless you adopt some such precaution, with the fearful swiftness of buttered light cakes at a Welsh tea. Weigh a yard some spare half-hour, taken from about half way up the stack, half way from the centre, so as to strike a balance between the top and bottom layers. The weight of hay varies (about two hundred-weight it should be to the square yard of close pressed upland hay); you may so, however, tell to a pound, by accurate measurement, how fast the rick should go. You must see that there is fresh wheat-straw ever ready, for they will not remember it. It is not their interest to do so even if their memories be good, which is far from being the case generally. Mind that there is a supply of spare resin in the saddle-room for the strap, and a file ever ready for the knives of the chaff-cutter. In the apportionment of your stacks, Tusser's admonition is:

> "Lay coarsest aside for the ox and the cow,
> The finest for sheep and thy gelding allow."

This, of course, has no regard to prize cattle.

Slanging.—In the course of my instructions, I should neglect an important feature if I did not dilate a moment on the necessity of an occasional

smart word in season. It does not do always to be quite pleased with everything. Everybody will flag without an occasional push to keep up the momentum. This is really as essential to the comfort of the dependent as the master. Continual "nagging" at your servants will spoil their tempers, and the reputation of your place. A continual dropping depresses, and ultimately angers. Smart's the word, and short. The first moment you find things beginning to go wrong, however slightly, by opposing, end it; for, whenever it begins to gather, it is surprising how soon the machine will be broken. Speak up at once—sharp's the word. Concisely, clearly, conclusively, let your will be known. From your lips down to the base line of your neck—so far and no farther must you "slang;" 'tis an art soon learnt that pays most profitably: not lower than your throat, mind, or it will disturb your liver, and so you will suffer more than the culprit himself. A quarter-deck voice—quick, no time or place for rejoinder, and forget it the moment it's over. So, very shortly, your very air will freshen them. The effect is wondrous, and you will be all the happier together. A man of this stamp, if generous, as he should be, is far the most popular of masters. Only remember — once again let me remind you — the moment things go wrong, however slightly, speak. If you find that speaking is no use, then make no bones of it, but, in farming parlance, sack the offender; further to sink him in the Bosphorus at the moment you might be inclined, but of that n'importe, you will not have the chance. It cer-

tainly, in some cases, looks very much as if nothing would do but the prescription furnished for the refractoriness of the Emerald Isle—a twenty minutes' immersion under water. To this destiny, however, we must be content to leave the lawyer in "Colleen Bawn," or we shall have some one of his brethren upon us with his meshes pretty soon.

MANURES.

Every plant, as any one of the numerous manuals on agricultural chemistry will inform you, requires special elements of food to make it thrive. For your need you had best consult some respectable manure manufacturer, who will supply you with the very article you want far cheaper than you could produce it yourself. Messrs. Proctor, of Bristol, I have always found most obliging, and their manufacture all it was represented to be. The prospectuses of various houses are, however, now so handy, and the chances of cheating so far lessened by the spread of chemical analytical skill, that you may suit yourself for the reading exactly with the particular refreshment each crop requires: as, for instance, for turnips and cow-pasture, a bone preparation; for wheat, a blood compound; for vetches, gypsum, &c.

It is best to do business with an old established firm.

Superphosphate for roots and a milk pasture, but *Guano for grass*, if you can rely upon obtaining it good. There are many ways of testing it: by water

for the presence of sand; for quality, by heating over the fire in an iron spoon. The residuum obtained by this latter process, of one hundred grains, should weigh forty grains of ash; which, again, on being tested with muriatic acid, should leave only two or three grains of insoluble matter.

After all, deal with the respectable and be safe. A knave may always baffle you if he pleases. Guano starts a root crop capitally; but after that, too great a show of leaves is not desirable, being usually as likely a sign of ultimately deficient bulb, as a private banker's suddenly setting up his carriage is said to be of his solidity.

The Blood Manure I have known to produce a most surprising effect upon a field of sickly wheat. On the other hand, the poorest sample of this grain I ever gathered was on the plain of Waterloo, by the very spot where the terrific struggle took place between Kellerman's hitherto invincible Cuirassiers and the armourless Life Guardsmen of England. How long the effects of that "red rain" lasted, one cannot tell. It may have been traded on too long. Anyhow, the sun-embrowned old lady at the adjoining farm of La Haye Sainte could supply me with no better.

Home-made Muck.—Still, fleeting is the virtue of all these "artificials;" a tonic mixture are they, but not wheaten bread and wine and oil for lasting sustenance. Hurrah! then, for the home-made hay-built heap, that is the refuse of your sheds and stable. Muck after all is the stuff that should be supplied occasionally to every field. Its influence is not so

passing. As the Kentish labourer's log of cheese—as the dough pudding of Suffolk—as the "bone" in Patrick's potato—it has its special and enduring value. It sticks in the field's gizzard, and the soil can last the longer for its presence. Mind you haul upon the corn-lands only straw-made manure; no hay-loft sweepings, bottom soil of ricks, weed heaps and the like, or you will have to rue the venture.

The question whether all manures should be softened and put on with a water-cart, &c., seems to be going by default. The fields I fancy have not been found to appreciate this spoon-meat system to the extent that the enthusiast might desire. Give their digestion a chance of work. It is surely better for powers implanted by nature to be obliged to labour for their living a little. Fine wholesome compost, with somewhat of substance in it, making a demand upon their mill, is what they recognise and best reward.

Mind, then, and reserve plenty of litter—straw, fern, leaves, aquatic weeds, peat, sawdust, burnt clay, wood ashes, &c.—wherewith to strew your yards in summer, for soiling under cover undoubtedly fattens a beast sooner, and leaves you a good heap of dung to be evenly distributed over your pastures instead of fine-fanging the spot it falls on, without benefiting others, as the deposits of grazing cattle do. Every farmer, Young considers, should be able to dress with the home-made compost one-fifth at least of his arable land annually. "If he has a thorough command of litter, and money enough in his pocket

to buy plenty of cattle, it will cover a third of it."

Home-made manure, the yield of good hay, cake, and corn, there is nothing after all to be compared with it in virtue; well rotted and soap-like for the turnip—a fat, indolent vegetable, that likes its food soluble; rather fresh and strawy for corn lands and the clover lay, particularly upon heavy and tenacious soils. In this latter case it protects the growth of the young blade, while its juices draining down administer comfort to the rootling. It is at once food and clothing to the springing crop. "It is a fact that stock not in fattening condition make good dung in summer, but they do it not in winter;" especially when straw fed.

It is the quality of their food that makes the difference. The manure from young animals is inferior to that of the adult. Much passes from the full-grown which is required by the expanding frame of the infantine; viz. the phosphates, or bone material. The manure of lean animals is inferior to that of animals in good condition, inasmuch as their system absorbs more of the nitrogen and mineral matter existing in the food, as a dry sponge beats a semi-soaked one in drinking.

On this head hear Mr. Mechi, whom we shall come not to sneer at some day: "When I began farming, I had a notion that purchased manure, guano, nitrate of soda, and other things were profitable; but experience has taught me that by far the most profitable way of obtaining manure, which is in fact obtaining additional produce, is to purchase a considerable

quantity of grain, or of linseed, and to feed stock that is bred upon the farm. Mr. Lawes, in an admirable paper in the last number of the *Royal Agricultural Society's Journal* has clearly shown, that for every five pounds of flesh that is increased by the animal, twenty-five pounds is rejected or ejected in the manure. That has been proved beyond a doubt. Therefore if we can purchase a large quantity of grain, I do not care of what sort, or from what country, if we can purchase it, and sell that grain to our animals on the farm at the price we gave for it, it requires no conjuror to show that we are enormous gainers by getting our manure of the best quality, for nothing. It was proved in the paper to which I have alluded, that where animals are purchased at a dear rate for grazing, where they are fed with hay, oilcake, and grain, all purchased,—that though by these animals we lose money, as we know we frequently do when the account is balanced, still the manure gained from them was not half the cost of guano; and of course it was far more advantageous in its bulk, which is, in my opinion, an important consideration. We know, practically, that where box manure is applied to the land—I see it clearly in my fields—that the land feels it at least a year or two longer than any artificial manure you can put on. I am not speaking of washed farmyard manure, because I consider it is something like the tea-leaves that are left in the pot after the best of the tea has been poured away. But I am quite sure that I shall be glad to have my opinions confirmed by practical members present, that a farmer will never thrive so

well as when he invests as much of his capital as he can possibly afford, in breeding stock, in fattening them with purchased food, and, in fact, in selling to his stock that spring corn which is now frequently sold, never to return to the farmer. He should send his spring corn to market on four legs instead of through the merchant or miller. I consider *that* one of the most important points in agriculture; and, for my own part, I am now consuming and purchasing at the rate of five hundred quarters of barley-meal annually, on a small farm of one hundred and seventy acres; and I find that it answers my purpose so well, that next year I shall purchase one thousand quarters of corn, and consume it on the farm with stock, in addition to the pease and beans that I now grow; of course in addition to all the roots and all the green crops."

It may be as well to note here that one man can fill ten to fifteen loads of dung per day. Four men filling forty-eight loads, would keep going three carts and five horses, two boys to drive, and one man to drag it out of the cart. Fifty cubic feet of dung makes one load, measuring about two solid yards, weighing about one and a half ton, and being worth on a rough estimate about a bushel of wheat.

In order to keep your standing crops even, so that a sheet spread across them shall touch every golden head, after the dung-heaps have been spread, send over the field both ways a hay-turning machine, upon which there have been put blunt curved fork-tines in lieu of the spikes used for the grass-crop. This process tears the saturated manure straw to fritters,

scattering it evenly over the surface of the ground, so that when ploughed in it yields every rootlet its fair share of sustenance, and the crop comes up level as a billiard board: whereas, under ordinary usage, the crop of a manured field throws up here and there a dark green-tinted tuft that tells of extra favour shown the soil of that particular spot by the fork of the spreader having pitched a dung cake which was not subsequently severed.

Manure Heaps should always be covered by a shed, having moreover upon each layer as it is added a coat of earth or salt to prevent the escape of the ammonia, termed by Mr. Huxtable so aptly "the spirit of the farm." They should stand in a paved hollow of about a foot in depth, or much of the best part will sink down into the ground. We have found the dark rich stains six feet beneath the surface when the dung-heap had been laid upon the bare ground. If there be no pipe from the centre of the hollow in communication with the manure-tank, it is an excellent plan to have the paving laid after the fashion of a "well-dish;" the liquid to be thrown over the heap with a scoop as it gathers in the well.

One ton of straw, under skilful management and ordinary circumstances, should make three tons of manure: the average yield of straw being 1½ tons to an acre, there will consequently be 4½ tons of manure made to every acre of arable land upon the farm.

One cow housed for the winter leaves a cubic yard of manure; in summer, half a yard.

The farm-building should be so arranged that the

manure from the stables, cowsheds, and piggeries may be thrown upon the same heap and mixed at once, the quality of the heap being improved and tempered by the admixture. It is a good plan to put a layer of sawdust, ashes, mixed earth and marl, the charred clippings of fences, tanners' refuse, in fact, anything absorbent, beneath, to catch the drainings; and when this cannot be done we recommend the "well-dish" plan.

When by a thermometer plunged in, the heat of a dung-heap does not exceed 100°, you may know that the fermentation is not excessive, and that there is not much gaseous matter disengaged and lost.

Dress.—The tyro will excuse my hinting to him that his devotion to his business may render his presence in the drawing-room less agreeable than he could wish, unless he take precautionary measures. He should have boots on purpose to paddle about the fields and yards in, to be changed at the hall door, and a shooting-jacket, if not a suit, expressly for out-door work. He will have read how by the help of lard run out in shallow glass drawers, and strewn with fresh plucked blossoms, the flower-farmer by the banks of the Var detains for future service on the toilet-table the fragrance of the jasmine and the heliotrope. This affinity which scents have for grease becomes a serious nuisance, when the woollen dress absorbs the smell of stable and cow-shed. Even the perfume of fresh hay, second hand through this medium, becomes unpleasant. As much as may be, accordingly, let your predilection be for linen.

What an outbreak I anticipate in behalf of the

Magenta shirt and "flannels." The fair sister, notwithstanding, and the *placens conjux*, will thank me for my suggestion.

Feeding.—There is no department of the farm duties that requires more careful looking after than this. Whatever be the stock, wherever they may be located, whether in the cart-stable, the cow-shed, the loose box, the poultry-yard, regularity of feeding is the next essential to good food. At the same hour every day, not too much at a time, and that of the best, should be given. Violent intervals altogether upset an animal. I have a theory that the hunter would last out better if, as I remember to have read was done by one old huntsman, a piece of toast sopped in ale could be carried in a case with his rider's lunch, and be given him about half way through the day, at any convenient check.

Anyhow, the feeding on the farm must be regular, or you are sure to suffer at least in pocket. An animal once in condition, it takes comparatively little to keep on so. But it is up-hill work to lay flesh on a lean, especially if an aged, beast. What is called the "calfmeat" (of any animal) should be detained from the first, and advanced gradually by steady attention, until oftentimes the yearling heifer will fetch between twenty and thirty pounds from the butcher. Five pounds at least you may calculate it will take to bring a thin horse to a fair plump development again. Thorley's food is a great help, but discontinue it and your stock drifts back in double-quick time. More recent experience of it, on an extended scale, has brought me to the conviction that feeding

on such stimulating food is, after all, but the plan of the Styrian peasant, who sustains an unnatural plump loveliness by repeated, incessantly increased, doses of arsenic. And what servitude is this? But intermit the dose, and the cord of life is severed. Once begin with Thorley, and he has you safe as one who holds your title-deeds. So long as you do adopt his condiment I must bear my willing testimony to the superb condition it induces. The only question is, dare one with impunity leave it off? My experience echoes No.

Never throw his food before a tired horse the moment he comes in, nor allow him too free a draught of water. His mouth he may just wash out. The plan is to have a mash or gruel ready. I have noticed a careful groom of mine, how he always has a fragrant bucket ready for his horses, and which he declares the boys would eat if they might; a compound, one might imagine from the scent, of all meals that are palatable — bean, wheat, linseed, barley, with a tinge of treacle, or some such delicious aid. All he will tell me when I ask, is, that it is "rare good stuff," and that "anything that will make a jelly, sir, is the thing."

This is in accordance with the teaching of old Drury, who was so strenuous, if not also the first advocate, for compounding messes in lieu of dry food for all kinds of stock. Wheat-straw, he shows, soaked some hours in water, yields a nutritious jelly, which, stirred round with meal, boiled nettles, and the like, he pinned his earnest faith by. It is on a stimulating mixture of pollen and honey, "of a

jelly-like consistence," that the maggot neuter is developéd into a queen-bee.

The Red Indian never eats for at least twenty minutes after exercise. The sense of uncomfortable repletion which is caused by offending in this respect, experience has taught him to avoid.

If, after warning, you will persist in flooding the paddles of your own, or your animal's digestion, you must assuredly some day look out for mishap. A very common cause of colic is an animal's swallowing greedily the chaff that is emptied before him by the heedless ploughman, and then drinking as eagerly of water; the mass swells within, and, impeding circulation, is the cause of infinite disorder.

On the other hand, it is essential that sufficient quantity be subjected to the digesting organs. "A dog was fed on the richest broth, yet could not be kept alive; while another, which had only the meat boiled to a chip (and water), throve very well. This shows the folly of attempting to nourish men by concentrated soups, jellies," &c. (*Sinclair's Code of Health.*)

"When the food is nutritious in its character, but of small bulk, experience has shown the advantage of mixing it with non-nutritious substances in order to give it bulk and solidity; for if this be not done it does not exert its due stimulating influence upon the stomach, the gastric juice is not poured forth in proper quantity; and the result is, that neither is the sense of hunger relieved, nor are the wants of the body satisfied. Thus the Kamschatdales are in the habit of mixing earth or sawdust with the train

oil on which alone they are frequently reduced to live. The Veddahs, or wild hunters of Ceylon, on the same principle, mingle the pounded fibres of soft and decayed wood with the honey on which they feed when meat is not to be had; and on one of them being asked the reason of the practice, he replied I cannot tell you, but I know that the belly must be filled." (*Carpenter.*)

With this accords practically the chopping up wheat-straw with vetches for the teams in summer, as most large farmers do.

Ploughing.—Upon this subject there is enough written in any of the staple works on agriculture. I would only recommend the amateur not only to study the few simple principles that underlie the operation, so as to be able to judge of a man's work whether it be well done or not; but he should moreover occasionally take the implement into his own hand, not minding a few rough thumps, and not be content until he can not only drive a straight furrow, which with a Hornby or Howard is child's play, but can also turn it and start anew. And if he have any pluck about him he will not even rest here, but will learn to guide the old-fashioned plough as well, on the principle that the best rowers are taught in an old weighty pair-oar rather than the flimsy outrigger. Then will his men unreluctantly acknowledge his prowess.

Press along with your ploughing whenever you can; the sooner you turn your surfaces the better. You cannot be wrong except in wet weather. You should not turn a soaked surface in, the moist soil

will keep the weeds alive beneath; besides that, if there be any clay in the soil you will have left a patent-glazed brick kind of furrow that will deal on no terms: that shall defy the king and all his men, with Crosskill and drags to boot, to reduce it to anything like fine tilth. Plough up the stubbles at once, but scarify and harrow them first, for then one scorching day will annihilate for you half the weeds offhand.

Plough often, plough deep, keep continually ploughing. Nature's storehouse, the air, will replenish soil so disintegrated with many a manurial element of prime value.

How various is the experience of different lands. Whereas the husbandman beside the Nile has but to pay out his seed over the quarter of his raft, on to the verge of the retiring flood, to be repaid by a garner-bursting harvest; and the Syrian gathers abundantly from a soil which he only scratches with a homely implement, depositing his seed between the stones for moisture's sake; the Shetlander has, after careful cultivation, his wheat out oftentimes in November, and on the mountains of Wales it will sometimes not ripen at all.

There is only one thing that I would remark, and that is, that as soon as any field is finished, the ploughs should straightway be wheeled off to the one that is to be broken up next. And the hedger should be put on at once to hoe close up along the fences where the plough could not reach, and in the corners, so as to get the work done offhand. As in reading for improvement you should always shelve

one book before you begin a second, so in farming you should turn off each operation in itself complete. The neglected fag-ends of work are the very pest when you come to "closing up the rivets" in a hurry for action: it is a point, moreover, to which not one working man in a hundred will attend of himself.

Medical knowledge the young farmer ought to have in a certain degree, especially when we are informed (*Youatt*) "that one-tenth of the sheep and lambs in the United Kingdom die annually of disease, and at least a fifteenth part of the horned cattle by red-water, milk fever," &c.; especially when living in a retired district he is at the mercy of an ignorant cow-leech practising as a V.S.

Skellett's work on the parturition of the cow and diseases of neat cattle is well worth the mastering, nor is it a difficult task.

You should learn to bleed, too. Bend a young cabbage-leaf across some portion of your finger upon which you do not put any very especial value, and then with a lancet practise until you can succeed in slitting across the upper membrane of the leaf without wounding the lower one. When you can do that cleanly and with certainty, you have the right to consider yourself an adept, and may venture on a vein, taking care only that your lancet be held up stream at an angle of about 30 deg. to the line of the vein. Then dive in with a brave bold cut, for the quicker the blood flows the better. A lancet, if you can use it, is far better than a fleam, but requires a skilful hand. For all further particulars on this subject see Youatt.

In a case of stomach staggers, when the cord around the neck threw an extra weight of blood upon the brain, I have seen a horse fall over when they attempted to let blood with a fleam, and he would have died upon the spot if it had not been for the good nature of a surgeon, who, dreadfully distrusted all the while by the rustic ignoramuses around, sprang the vein with his pocket lancet, to the instant relief of the poor creature. This first opened my eyes upon the subject.

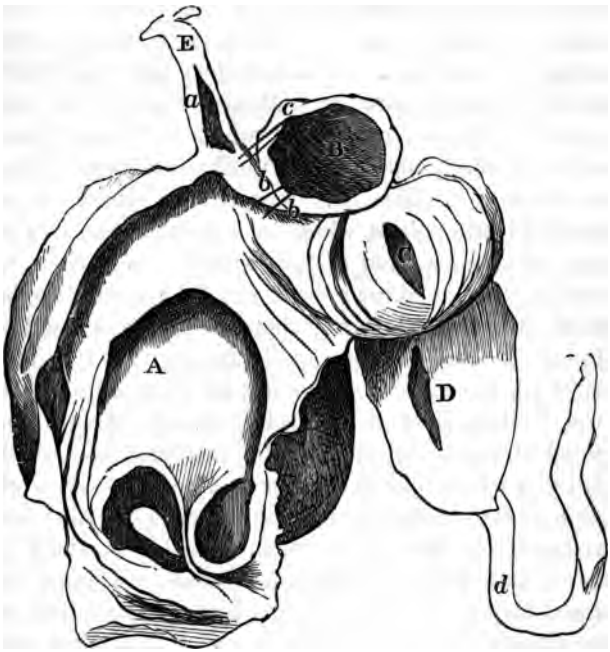
Some years since I remember meeting a distinguished barrister at Ilfracombe, who had come down with a couple of hunters for the refreshment of a fortnight's sport with the red-deer hounds of North Devon, his papers following by every post. It seems but yesterday that I saw him, to my astonishment, sew up with the utmost skill an ugly gash in the thigh of one of the horses which had cut itself in crossing a stone wall. An evening or two after I joined him accidentally, going to bathe, immersed in the study of a Spanish volume. He had been in his day a university scholar. It is a move assuredly in the right direction that of late these many-sided men have grown less rare. But to return. Besides being versed in the mysteries of bleeding, you should know how, if requisite, to deliver a ball down a horse's throat without choking him, and trace its course along the gullet in its mouse-like run beneath the skin, so as to be sure that the old stager is not chewing it by preference, or reserving it as a quid to be ejected when your back is turned. Not only should you know how to drench a cow with scientific

gentleness, but you should make your best men acquainted with these things too. When they have once learnt enough to get interested, it is surprising how their anxiety about the animals under their care will increase. It was some time before I could teach my herdsman the necessity of administering a drench gently. It was not until I had sketched upon the inside of the cow-shed door a chalk design of the cow's interior arrangements that I managed to get a wedge into his conviction. Once in, I followed it up by the dissection in his company of a stomach or two; so that now, he being a willing and careful man, whether present or absent myself, I know that if a drench be required it is properly administered.

It may be convenient to the tyro that I should briefly describe here the stomach process of the cow. In pasturing she tears a quantity of grass caught around with her tongue hastily, as the schoolboy gathers dandelion leaves or clover for his rabbit, only he does it with his hand, she ripping it off compressed between the lower incisor teeth and the upper (toothless) jaw by a movement of the head. The longer the keep is upon the cow pasture the better, for she does not cut it in her bite. Having torn off a mouthful, she passes it hurriedly into her paunch (A), through close folding-doors that yield before its weight. There it lies always ready at call. Having taken her fill she lies down for her siesta, usually on her left side. (Can this be the cause that the left kidney is always fatter and larger than the right? being a lot the reverse of which is experienced by Adolphus's whisker, who will persist in sleeping

always with the same cheek on the pillow). Then begins at once, when she is down, the milling process termed rumination. By a voluntary muscular effort on the animal's part the gathered stores then pass into the second stomach (B), which is "lined with a series of hexagonal cells, not unlike the comb of the honey-bee." (*Rev. G. Wood.*) In these it is moulded into pellets, which by a peculiar exertion of the muscles—a kind of jerk which it is curious to watch, are then thrown back into the mouth to be reconsidered and leisurely chewed—a process familiar to every one. These quids having been calmly enjoyed, the débris of the morsel *slips down past* the folding-doors of stomachs (A) and (B) into the third stomach (C), termed the maniplus, and which is hung with rough leaves or membranes that work to and fro, effectually triturating what remains unreduced by the mouth process. This stomach is hence called the psalterium or psalm-book, from the resemblance these membranes bear to the leaves of a volume. Hence, the pounded mass and juices pass into the fourth and last receptacle (D) the abomasus, thereupon to be parted: the nutritious aliment being despatched on a line of circulation through the venous system, the refuse being ejected in course again as manure to take part in the wondrous round of vegetable economy. This gauntlet of custom-houses is run by the food of every "ruminating" animal.

These stomachs cleaned are what we hapless mortals consume in the white garb of onion sauce, as the popular dish—tripe.



On the above rough sketch, from a plate in Youatt's able work,

E indicates the gullet;

a folding-doors opened by the falling mass of food;

A first stomach;

b open passage by which during rumination the stored food from A is thrown into

B second stomach: whence by a muscular effort it is returned in a pellet into the mouth again, through

c the passage : thence to return chewed to
C third stomach ;
D fourth stomach, and, finally,
d the first intestine.

The herdsman likes to see the cow lick her coat, and considers it a sign of good health to see the hair touched roughly up with a peculiar glossiness. This habit is productive, however, of the growth of peculiar, round, light, smooth, kernel-like balls of a spongy texture, in the paunch (*a*). I have one beside me as large as a big orange. Many object to keeping several calves in the same pen, on account of the habit they soon form of licking one another. The miller's horse has often a similar ball within him after death, being a concretion of ammoniacal phosphate of magnesia from the dry bran with which he is too freely indulged. Buffon states that in some countries it is usual to attempt to prevent the cow licking herself; and it is done by rubbing her with such stuff as the stopping our grooms use for the hunter's feet.

The reason why a cow should be gently drenched is, that if roughly given, the hornful of physic plumps down upon the folding-doors of the first stomach (*a*), opening them in its fall, and gets lodged there not to pass further, for the sick cow does not ruminate. By administering the liquid gently you slip it past these folding-doors, and it glides as the quid goes after chewing, right into the system at once. The same applies to the sheep.

A Medicine Chest is an absolute essential upon the farm, especially if at all retired in the country.

You may buy them ready stored, of any size; or you may have one fitted to your taste and wants. Mine I procured from Mr. Twinberrow, of Edwardes-street, Portman-square; the fitting I left to him, and have never had reason to repent it, but rather the reverse.

It contains a set of twelve bottles holding nitre—Epsom salts—powdered ginger—powdered catechu—castor oil—Barbadoes aloes—cordial powders—anodyne carminative mixture—carbonate of potash—carbonate of soda—allspice—powdered caraway-seeds. It has, besides, a recess, in which are stored a glass measure—a lancet—a set of fleams—a pot of digestive ointment—a case of needles, some thread, tow, and lint—leather socks for lame sheep—and a few other small necessaries which have accumulated. A number of useful remedies for common complaints I thought to adjoin here, but you will find all you want, with symptoms, &c., to boot, in any good veterinary volume—such as Youatt's, White's, Clater's, and now Mayhew's or Stonehenge's illustrated and excellent works. The plain recipes given at the end of the *Farmer's Almanac* for the different ordinary disorders of the different farm animals, are very sure if adopted with judgment and in time. One thing I advise you never to omit, that is, a *post-mortem* examination of all stock that comes to an untimely end. Open at once and ascertain as far as you can the cause of death. A certain useful amount of practical knowledge you will soon attain. For instance, a lamb falls; he is inspected: a lump of wool is found within him, sucked down from his

dam's coat. You know, then, that there has been some neglect in cleaning about the udder of the ewe. You have only to scold to put things right in regard to the rest, and you are relieved of the idea that an epidemic may be coming. Your game-fowl pine and die. You investigate the interior, and have sadly to recal the charge of shot you so carelessly let drop by your cart-stable door. So your knowledge and your profit grow. Occasionally, in some districts, a sheep will be found unaccountably dead upon the field. Have it plucked and examined, especially if there be lurking about an encampment of that nut-brown people whose winter quarters are in Shoreditch, and whose summer haunt is the green country lanes; whose vocation is vaticination, and the repairing of tin kettles; whose weakness is for the rooster you saw last in your farm-yard sitting on a rail and sleeping very sound, but who has gone now into the seething caldron, under an old hag's superintendence, which splutters richer than that of the witches.

This people have a treacherous fashion of running a long needle into the victim's heart, and then coming to beg next day from the too credulous farmer the old sheep that has died upon its pasture. If to ornament your saddle-room you would like a tiny skeleton of hen, rat, rabbit, or the like, you have only to enclose a dead specimen of the kind in a small crate, and put it alongside an ant-hill. That busy folk will soon pick its bones for you, leaving it exquisitely polished and set up.

Salt.—For young or ailing stock there is nothing like a run upon a salt marsh. Sheep seldom rot there.

In Cheshire, after rain, a custom used to prevail of turning water out from the salt springs over the land. A recent writer in the *Mark Lane Express*, states that salt sown upon a meadow assails the weeds by preference. This gift of discriminating between right and wrong I never before gave it credit for, but we live to learn. Its value as a store upon the farm cannot certainly be overrated. There should be always a ton or so in a spare stall, or some other convenient receptacle, ready to sprinkle on damp hay, to sow upon the mangold field, to powder slugs with, to kill weeds with, to scatter on the chaff in the sheep troughs, to mix with the manure-heaps, where it destroys the vitality of noxious seeds, &c., &c. For the same purposes it would seem to have been used in old time. Of salt that has lost its savour, we read that it was fit to dress neither the soil nor the dungheap, but was thrown forth as spent, *οὔτε εἰς γῆν, οὔτε εἰς κοπρίαν εὔθετόν ἐστιν· ἔξω βάλλουσιν αὐτό.* In fact, it is always wholesome, and never in the way.

Singular is it, if true, as I have seen somewhere stated, that the sick deer will travel miles from its forest to the sea for the benefit of the water. Bees near the sea thrive the best, and are said to fly miles to drink it.

Here let me introduce a few quaint receipts which I have come across from time to time, which may serve to amuse if they suggest no hint to the quick mind, but which have no more relationship to each other than a string of keeper's trophies:

1. For a horse's heels that swell, ride him into a

pond that has a great many leeches in it, and let them fasten to his legs and kill themselves.

2. Stop rat-holes with wool dipped in tar.

3. To ascertain if there be rats in a stack, run in a hazel-stick with the peel on that has been soaked in grease, and leave it there. If there be rats, they will soon leave the marks of their teeth upon it.

4. Musty corn, lay out on cloth all night in the dew and dry next day in the sun to sweeten.

5. For tail-ill in a cow, worm in the tail (which means no more, gentle reader, except to the superstitious, than the white tongue of a human invalid, viz. that the patient is internally out of order), slit the skin and put in salt, soot, butter, and bruised rue, then rub her teeth with orange-juice.

6. Sand strewed in the corn-stack prevents mice burrowing into it by falling into their ears.

7. Birdlime in rat-holes, if they touch it, will make them scratch themselves to death.

8. To kill worms, stick the bottom of your plough full of sharp-pointed nails.

9. To keep your sitting-room clear of flies, close the windows towards evening in summer-time and smoke them with straw, or brimstone, or burnt cow-dung. A bunch of ash-leaves hung aloft will attract and occupy the swarm.

All details of agricultural practice must vary with the district, and if a man be not competent to recognise and adopt therein what suits him best he had better give up business. He is not competent to be a farmer; indeed, wherein is he likely to succeed at all? He may have given him the formula,

but upon his industry and intelligence depends his ultimate familiarity with the working of it. To supply in detail examples for the taste of every different profession were simply the old Danaides' story of filling the perforated tub.

When you first start, young friend, look out for disappointment. Do not, I mean, meet it half way, but be not surprised if things go wrong.

One now celebrated breeder I know who lost the six mares he started with in close succession, but he persevered, and ultimately won. We all in turn have to realise the lament of Lalla Rookh:

> "Oh, ever thus from childhood's hour,
> I've seen my fondest hopes decay;
> * * * * *
> But when it came to know me well,
> And love me, it was sure to die."

You cannot be comfortable until you accustom yourself to take things as they come, for better for worse, and multiply your stock so as not to heed an occasional loss. Badly as you may be off, you cannot well fail oftener than did the Scottish king. At the worst remember Robert Bruce; with him, be courageous and imitate the poor spider's endeavours; six times thrown back, on the seventh success rewarded his attempt. So, eventually, you are sure to gain hold. But, whatever may befall you, there are thousands worse off. Look below you, not above, when dissatisfied and grumbling; or turn to the page where Sidonia so excellently solaces the disinherited Coningsby, and you will rise in good spirits from the study.

Lime.—Almost the first piece of unsolicited advice with which his old-fashioned neighbours will present the farmer, is the recommendation to "lime his land." Liming, in their estimation, is a Holloway's pills remedy for all disorders and infirmities a farm can suffer from; and many is the unhappy field that has been stimulated and worn to an untimely end by the injudicious adoption of this ancient panacea. There is land near Flint, as, indeed, in many other localities, that will positively grow nothing now, its vegetable element having been entirely exhausted by incessant use of lime. The fatal error was run into of imagining that lime manures mainly, instead of its being rather a means of calling into action the hitherto dormant vegetable element of the soil. Lime does good service upon newly broken-up land, or mixed in compost with old banks, road-side parings, pool mud, or the surface soil of woods; or laid upon land in high condition.

Lime, mixed with manure, will rob it of its virtue. The quaint old Drury knew that long ago, though the reason of it has been left to modern chemists to explore. The manure, however, once incorporated with the soil, and its essence absorbed, if you then use lime, you will lime to advantage.

Quick-lime laid upon the surface of drained land will produce a succession of fine grasses, in lieu of the coarse bent, and carnation grass that clothed it before. Newly-slacked lime, at the rate of two tons an acre, harrowed in with the wheat, is found effectually to prevent the attacks of grub and wire-worm.

Contrary to what might be expected, soils over limestone are often especially benefited by a dressing of it in a caustic state. Mr. Nesbitt (see his excellent work "On Agricultural Chemistry," Longman and Co.) gives a simple rule for discovering whether any particular soil requires liming or not; that is, to procure some of the earth of different parts of the field, and drop some spirit of salts upon it. If it effervesce slightly, there is a sufficiency of lime present; but if no effect be produced by the application, then a dressing of lime will be advantageous to the soil.

For the following interesting information I am indebted to the "Journal of a Naturalist:"—

"The utility of lime as a manure consists in loosening the tenacious nature of some soils, rendering them more friable and receptive of vegetable fibres. It especially facilitates the dissolution and putrefaction of animal and vegetable substances, which are thus more readily received and circulated in the growing plant, and it has the power of acquiring and long retaining moisture, thus rendering a soil cool and nutritive to the plants that vegetate in it.

"The power that lime has of absorbing moisture will be better understood when we say that one hundredweight will, in five or six days, when fresh, absorb five pounds of water, and that it will retain in the shape of powder when slackened, or loosened, as is commonly said, nearly one-fourth of its weight.

"Lime to be used as manure must be in a pulverized state, and by drawing on the land the quantity we do, we convey to every acre so dressed an equivalent to two hundred and fifty gallons of water, not to be

evaporated but retained in the soil as a refrigerant to the fibres of vegetation."

There are many "lime plants," that is, plants that require this mineral constituent as a main element of the manure that is to force them, as peas, saintfoin, clover, vetches, &c., in fact, the leguminous class. For the potato (the best of all manures for which was once found to be the oak-leaf), last year authorities decided lime and salt to be the best dressing. Lime alone, composted with earth, has long been a favourite substance for potato land, at the rate of one hundred bushels an acre. "The return in general is not so large as when grown in manure from the yard; but the root is said to be more mealy and better flavoured."

Long ages ago the use of this fossil manure originated. Most generally diffused, too, are the strata of calcareous matter, so that they have been described as "the bark or external covering of our globe" (Fourcroy), being, according to some, the solidified sediment (if I may so term it) of the remains of the skeletons of putrescent sea animals gradually deposited at the bottom of the sea. With this theory compare the account we had of "gray mud," and a creamy mixture, that was brought up in experimenting for the bed of the Atlantic cable, and which, it is conceivable, shall furnish the calcareous supply of human generations yet to come, when the sea shall have supplanted the land, and our record has mouldered away.

There is much due also to the untiring and multiplied efforts of the minute coral insect: as witness the basement of many a South Sea island, and the

continuous reefs by which the seaman coasts for hundreds of miles in the Gulf of Carpentaria.

Limestone is by others considered of igneous origin.

It is, anyhow, of the genus of the primitive rocks. Yet, after all, there is much of mystery overhanging its action upon the soil in the way of agricultural benefit. How it affects it exactly and utterly none can say, but it is certain that no soil is fit for much as regards vegetable growth, in which there is not present, either naturally or by artificial application, a certain element of lime.

On this point Nesbit remarks, "Without the presence of carbonate of lime in the soil, you can never have the full action of any description of manure. If there be sulphate of ammonia in the soil, you cannot suppose that it will be taken up into the plant as sulphate of ammonia: it must be decomposed before the ammonia can be absorbed by the growing plants." This carbonate of lime effects. "You could not usefully apply guano or any other artificial manure without a proper amount of carbonate of lime in the soil."

But this demands a caution as to the mode of applying lime to the fields.

First, let me explain the theory of lime-burning. When limestone or marble is exposed in confined heaps to a strong white fire above redness, the water of crystallization, which makes the particles adhere in a solid form, is expelled, and the carbonic acid gas escapes; a light, porous, cinder or shell, very readily pulverized, remains, equal in bulk and hardness, but

about two-thirds only of the original weight of the limestone. The lightness of the shell is a criterion of the quality, as the earthy mixtures, always present more or less in the rock, do not lose weight by calcination. This shell has a strong attraction for moisture and carbonic acid, and, if left exposed to the atmosphere for any length of time, it absorbs both from it, and gradually returns to the state of hydrate and carbonate, or lime united with water and carbon; with this difference only, that it is now a fine, impalpable powder, instead of being a hard stone.

So does nature beat man.

The chemist can dissolve and consume, but he cannot, from the known elements, compound and produce a diamond. Elements very cheap, but then diamonds were of no value. To recover our track, however; as the best-known plan, cart limeshells (*caustic lime*) on to the fallow for barley in the spring, and harrow it in after ploughing—(that is, on light soils; on clay or heavy soils, it is best applied on the clover ley), because one eccentricity, peculiar to lime, being that it will burrow down as a sand eel and get lost in the course of some seasons, you must adopt every plan of keeping it near the surface. Your barley will then be prime, and a rejoicing clover crop shall succeed. Cart the shells on to the fallow, depositing them in heaps at the rate of about forty bushels per acre (to be repeated every five years); just moisten sufficiently to reduce to powder, spread at once and harrow in. Too much water produces a paste. You may keep the shells in a sloping heap under straw, for a year, good; but, if

the heap be exposed, the lime loses its causticity and becomes *effete* and lumpy, and cannot be spread in fine powder, as newly-slaked lime.

These lumps are obviously more likely to sink in the soil than the powder of the slaked heaps, which, having less specific gravity than most soils, can better maintain its position in the upper row.

Effete lime is mainly useful as preserving a good amount of moisture in light soils; it also gradually helps the decay and dissolution of organized bodies in the soil, and it arrests nitric acid, thereby preventing the escape of a nutritive element; whereas caustic lime breaks down at once, and destroys the organization of such animal and vegetable life as it comes in contact with; hence its value to mix with peat, moor-soil, buried vegetable matter, bark, &c., making an otherwise dormant element soluble in water, and capable of being taken up by the growing plants; which it further fosters by producing ammonia through a chemical combination of disengaged gases.

Caustic lime does good, also, by killing the slugs, snails, worms, grubs, &c., in the soil, and so providing a turtle-soup entertainment for the rootlets; doing them the good that we suppose the gardener intends his vines, when he buries horseflesh in the bed.

Caustic lime mixed with animal manure will play the mischief, as regards its immediate use, rendering the extractive matter insoluble. Intractable lumps remain. Spread them, however, and by exposure to the air, the lime will become eventually carbonate, the manurial matter will gradually decompose. Thus the benefit, though delayed, will not be lost, but will

by degrees dissolve, as the tunes on Munchausen's frozen bugle. Moral: Would that one could mix caustic lime with the pages of one's cheque-book!

Having in a certain degree explained the different effect, that *caustic lime* and *effete lime* respectively have upon soils, I must now tell you that the agricultural value of lime varies considerably (whether it be burnt from chalk, marble, coral, shells, or common stone) according to the district and the extraneous matter blended with the raw material. The purest sort, on being saturated with water, yields a soft, smooth to the touch, white, light, impalpable powder, which may be considered the best for the farmer's use.

From this Nesbit dissents, and in our neighbourhood here, I find that local tradition (never to be despised) directs a dark lime, burnt on one side of the river, to be applied to the fields, white lime burnt upon the further bank, being preferred for mortar and wall-washing. I have not yet had an opportunity of tracing "the reason why."

Nesbit's words I quote *in extenso*, as being too good to be condensed:—

"Limestones have been considered by some persons valuable in proportion to their purity; that is to say, in proportion to the absence of anything else but carbonate of lime. Limestone is itself a carbonate of lime: in its pure form it consists of twenty-two parts of carbonic acid, and twenty-eight of lime. When limestone is heated in the furnace, the carbonic acid is driven off, and pure lime left behind; that is to say, it would be pure if the limestone itself

were pure. I was remarking that it has been supposed that the purest limestone is the best. I shall now endeavour to prove to you that such is not the fact; but that impure limestone—that is to say, limestone containing other substances besides carbonate of lime,—is that which is best adapted for agricultural purposes. There are, in fact, no limestones found absolutely pure; all contain a certain amount of moisture, silica, iron, alumina, phosphate of lime, and even a little sulphate of lime. It is perfectly clear that limestones must be the better for any phosphate of lime which they may contain. As you are continually putting into the soil bones and other substances, because they contain phosphate of lime, it is evident that those limestones which contain the largest proportion of phosphate of lime are the most valuable, supposing the other constituents to be the same. We have analysed in our laboratory some hundreds of specimens of limestones; none were found free from phosphate of lime, while probably the average proportion of it was one per cent. Many limestones contain much more than one per cent. Some contain as much as three or four; but, supposing them to contain on the average one per cent. of phosphate of lime, in that case ten tons of limestone, or its equivalent of five or six tons of lime, put on the land, would furnish two hundred-weight of bone earth per acre, which I need not tell you would be a considerable dressing, and would, for years afterwards, prove advantageous to the soil. Well, then, many limestones also contain silica in a soluble state, so that when put on the land it is easily acted

upon, and, in fact, disintegrated; and I think it very probable that a limestone which contains a certain amount of such a substance as silica, in a soluble condition, is preferable to what is termed 'pure limestone.' Many also contain sulphate of lime or gypsum, and even these are better adapted for general use than such as approach nearer to a state of purity.

"You will thus see that my opinion upon this part of the subject is, that it is not the purest kinds of limestone which are calculated to confer the greatest benefit on the farmer, but that those which contain a certain amount of what are called impurities are the best adapted to agriculture, because they convey to the soil other constituents besides the calcareous matter."

Loudon, who was of opinion that limestones containing alumina and silica are less fitted for the purposes of manure than pure limestone—not that the lime they yield has any noxious quality, but because they furnish a smaller quantity of quicklime—adds the following interesting information:—"Very few limestones or chalks consist entirely of lime and carbonic acid. The statuary marbles, or certain of the rhomboidal spars, are almost the only pure species; and the different properties of limestones, both as manures and cements, depend upon the nature of the ingredients mixed in the limestone; for the true calcareous element, the carbonate of lime, is uniformly the same in nature, properties, and effects, and consists of one proportion of carbonic acid 41·4, and one of lime 55. When a limestone does not copiously effervesce in acids, and is sufficiently hard to scratch

glass, it contains silicious, and probably aluminous, earth. When it is deep brown or red, or strongly coloured by any of the shades of brown or yellow, it contains oxide of iron. When it is not sufficiently hard to scratch glass, but effervesces slowly, and makes the acid in which it effervesces milky, it contains magnesia. And when it is black, and emits a fetid smell if rubbed, it contains coaly or bituminous matter.

"There is very seldom any considerable portion of coaly matter in bituminous limestones; never as much as five parts in 100; but such limestones make very good lime. The carbonaceous matter can do no injury to the land, and may, under certain circumstances, become a food to the plant."

Magnesian limestone is injurious to plants, except when mildly applied to a very rich soil. The reason is, that "magnesia has a much weaker attraction for carbonic acid than lime, and will remain in the state of caustic or calcined magnesia for many months, though exposed to the air. And as long as any caustic lime remains, the magnesia cannot be combined with carbonic acid (so as to become *effete*), for lime instantly attracts carbonic acid from magnesia. When a magnesian limestone is burnt, the magnesia is deprived of carbonic acid much sooner than the lime; and if there be not much vegetable or animal matter in the soil to supply by its decomposition carbonic acid, the magnesia will remain for a long while in the caustic state; and in this state acts as a poison to certain vegetables.

"Magnesian limestones are usually coloured brown

or pale yellow," and lose less weight in burning than the purer stone. The obvious remedy for land, that has been injured by an over-dose of magnesian lime, is a dressing of peat. A most enduring mode of liming, when opportunity allows, is to cart the wreck of broken shells from the seashore on to the land. In a paper communicated by a Mr. Molyneaux to the Royal Society, from the pen of the then Lord Archbishop of Dublin, many generations ago, this practice is described as being generally adopted in the counties of Londonderry and Donegal. From mounds in the bay of Londonderry, composed entirely of shell *débris*—chiefly of the periwinkle, cockle, and limpet sorts—visible only at low water, he states that the countrymen used to come down and carry away large quantities in boats, which they piled up and allowed to lie upon the seashore, until, having drained dry, they were lighter to carry. They then conveyed them up the country as far as they could in boats upon the rivers, perhaps six or seven miles, when they were further conveyed in sacks on horseback. The allowance for a good dressing was about eighty barrels to the acre. It was found to agree with clay, wet or stiff, but not sandy soils. Its effect lasted so long, that the archbishop states he could "find none that could determine the time of its enduring;" whereas lime acted all at once—the shells melted only gradudually, and every year ameliorated the soil more and more. "In six or seven years the ground grows so mellow, that the corn that grows on it cannot support itself, and the land must be suffered to lie a year or two that the ferment may be a little quieted, and

the clods harden, and then it will bear again. For aught I could know or find, it continues to do so, with the like intermission, for twenty or thirty years.

This shell-dressing the archbishop directed his gardener to try in the parterre; with surprising advantage, he writes, to the carnations and other flowers, "indeed he never saw better." At one time they burnt the shells for lime, but accident or idleness shewed them that the raw shell answered better. Oh, then, for those miles of oyster-shells which Tennent describes heaped up "on that long sweep of desolate shore," in Ceylon, where the pearl-fishing is periodically carried on. The lime by Scarborough Castle burnt from the pieces of rock that the sea breaks off, his Grace mentions, is the best lime to be found for improving land with. Generally, lime made from stones hauled out of the sea makes better lime for agricultural purposes than the stone raised in a land quarry. The Aberddaw lime in Glamorganshire is celebrated for its binding power. It is made from the rubble and boulders on the coast, the rumble of which occurring at certain periods, the country people consider to be indicative of the approach of foul weather: the fact being, that the wind then sets in from the westward. These boulders, washed up and down, and worn round by collision, are the heart of the lias limestone, of which the cliffs are formed along the Glamorganshire side of the Bristol Channel. Layers constantly falling, under the influence of frost and tide, the softer portion being ground down and frayed by the action of the currents, is finally blown up, and forms a series of

picturesque commons, which, as you canter across them, you might fancy to have been in their day under water, so thoroughly sand-hills are they to the quick. Shiploads of this pebbly deposit are conveyed regularly away, to be replaced, however, in but a short time, by the busy deep. The higher up channel they are stored, the more valuable are they, being essentially there but the core of the rock. In altering an old church-tower not far from here, masons tell me it was found easier to smash the stone than to pick out the mortar, which had been made of this famous lime.

There is little left that occurs to me upon this subject, of direct practical use to the farmer. Suffice it to remind, that the effect which calcareous substances have in promoting vegetable growth, depends upon the quality of the stuff itself, the quantity used, the nature of the soil it is applied to, the amount of vegetable or organic matter to be acted on therein, the time of application, and the extent of its incorporation with the soil. The wide difference in the several recorded results is due to these varying elements of computation. Enough has been said, however, we trust, in these papers to help considerably the young agriculturist to a profitable solution of the problem. A few more hints, and I have done.

Lime is abundantly present in the dense matter of our earth; constituting 80 out of 100 parts in bones; in egg-shells 9 out of 10 parts, from which, during incubation, it is drawn by the embryo bird, indurating the cartilages and forming its skeleton.

It is phosphate of lime in milk that deposits and

consolidates the bone matter of young stock; gives that first requisite, good forelegs, to a colt, and due breadth of beam to the short-horn heifer.

The more lime and phosphates (there is an element of phosphorus in lime itself) you blend with the soil, the finer will be the root bulbs; so by consequence, the greater the number of animals fed, the more milk produced, and the more bone built up; which last again in turn is dissolved in vitriol to stimulate a new root crop; to feed a further increased amount of stock, to swell the osseous store of the manure manufacturer, to be reapplied to the soil, &c., &c., and so on *ad infinitum*—at such compound interest does nature roll off her gains.

That the immediate use of lime is to quicken the dormant powers of a soil, rather than to enrich it manurially, I have already shown: yet something even manurially it does; as an alkaline earth. Again, being less porous than sand, and more so than clay, by holding or subtracting wet, as the occasion is, it improves soils in which sand or clay predominate: as on the old red sandstone and granite formations. Where sourness (as in moorland) exists, owing to the presence of sulphuric acid, lime neutralizes it, and combines to form a sort of gypseous compound that is rather beneficial, and productive of clover, trefoil, &c. A sort of Epsom salt magnesian lime renders under such circumstances; which we can only trust to be, as some say it is, agreeable and serviceable to the soil, as we personally know it to be nauseous to the human palate.

How it is that overliming does harm, is thus. Let

me first explain that every plant consists of two parts, (1) what during its growth it has gathered from the air, being its vegetable element; and (2), a mineral element, or that which it has drawn from the soil. You burn a plant, and that which goes off in smoke is the vegetable, the ash remaining is the mineral element. Bury this plant, however—as for instance—by ploughing a mustard crop in preparation for wheat—and you give the soil the benefit of both vegetable and mineral element. Gradually in every soil that is well treated there accumulates from farm-yard muck and otherwise, much of this vegetable matter, to remain dormant until acted upon, as I have described, by caustic lime. So long, then, as any store of the vegetable element exists in the soil, so long liming will be beneficial; but as soon as this vegetable element is exhausted, then liming will only promote sterility; inasmuch as for lack of other food it will destroy the fibres thrown out by the seed from its own substance, and by the assistance of light and moisture.

Lime laid upon the surface of the ground, Anderson remarks, does little if any good, and is a plan that only the rich, who can afford to wait until it sinks in, should adopt. On the other hand, Nesbit speaks of your being able to write your name with lime, to be traced for years, upon the Exmoor turf, so manifest is the immediate advantage of its application. You will not, however, find a lime-heap leave its mark in the ensuing crop where it has rested upon the fallow as a manure heap will. And this may be what Anderson meant.

"The quality of grain grown on limed ground is superior ('smiles' more sweetly, to use the market expression) from its having a thinner skin, more flour, more starch and less mucilage, lime tending to promote the conversion of the latter substance into the former by hastening the ripening of the seed." (Darwin.) Hence the value of lime on late lands, whether the lateness be owing to soil or situation.

Respecting the quantity of lime to be applied to a soil by way of dressing, from one to seven hundred bushels per acre have been used under various circumstances, by different people. Some say that one hundred and sixty bushels per acre is a full dressing for a light, and eighty to one hundred for a heavy, cohesive soil. Burns states the most approved dose to be at the rate of from eight to ten bushels per acre, whether put on as two hundred bushels every nineteen years, forty bushels every five years, ninety bushels every twelve years, &c.

Some, having the command of ample capital, prefer a strong dressing put on at once, others, being inclined rather to repeated small doses, a mode which, perhaps, answers best on land that has been made right fertile by fair treatment. For newly-broken land, abounding in vegetable matter, the strong treatment is obviously preferable. Badly drained land takes an extra quantity, as it dissolves much. But, of course, you should drain carefully before you dress well with anything.

For leading out lime you require calm dry weather. With the heap handy on the headland, with a man or two to spread from each cart, and men to fill the

carts at the heap, that the horses may be kept moving, a cart will finish an acre in a day. Although lime applied after harvest kills more insect larvæ, still, on the whole, you should choose the spring or summer for liming for a grain crop, rather than the autumn or winter, inasmuch as heat, otherwise caloric, is one chief requisite for its full chemical combination with the soil. Don't lime turnip land late in the spring. It robs the soil of too much moisture. Respecting the various modes of applying lime to the soil, upon these red-sandstone fields of Herefordshire, great store is set by the scrapings of turnpike roads, which are repaired with limestone. In Ireland, again, they dig and spread upon their land a kind of stony marl (called limeclay), which consists of finely comminuted limestone deposited in a bed of clay. Then, the trustees of the forfeited Highland estates erected mills to crush limestone to powder to dust the soil with, but they did not meet with much favour. Another practice is to cast raw chalk upon the surface before the winter, for the frosts to make it friable. (To avoid extra weight in the transportation of chalk, if it be wet, it is best to have it burned to lime where it is found.) Still, many prefer, as being more beneficial to the soil, to break down, by mechanical means, the fresh deep-dug chalk, spreading it at once in the spring. It requires three or four times as much raw chalk as lime for a dressing; and lime burnt from stone is much stronger than that from chalk.

In order to judge of the goodness of lime, or to decide between two kinds, Dr. Anderson directs that,

"If the limestone loses much of its weight in calcination, and the lime-shells are extremely light; if the shells require a large proportion of water to slake them fully; if it is long before they begin to fall: if the limestone is not apt to run (or be vitrified) in the operation of burning; if it falls entirely when it gets a sufficient quantity of water, after it has been properly calcined; if it swells much in slaking; and, if the lime is light, fine to the touch, and of a pure white, the farmer may be satisfied that it is extremely good, and may use it in preference to any other lime that is inferior to it in any of these respects." Such is a sufficiently accurate rule for practical purposes.

To test the stone of a new quarry, as all calcareous matter is capable of being dissolved in acids, all other matter being left behind: take aquafortis or spirit of salt, or muriatic acid (dilute until nearly colourless if it emits fumes or is yellow); put it into a glass or earthen vessel; drop in some of the stone (dried and powdered); after each addition, let the effervescence subside before a new pinch is thrown in. After all is in, stir with a tobacco-pipe and allow it to remain for some time, that the acid may act on every particle and thoroughly dissolve it. To try if the acid be sufficient put in a few more drops, and if it effervesce proceed as before; when there is no effervescence all the calcareous matter has been dissolved. Take a piece of dry filtering paper (weigh it) and a glass funnel, pour your mixture in and let it filter slowly. When the fluid part has thus drained off, fill up the filter again with pure water, to wash

off the whole of the saline parts from the residuum, or matter that remains undissolved. Add water in this manner till it comes off without any saline taste,—suffer it then to drop off entirely,—dry it thoroughly, and weigh the paper with its contents. The difference between which, and what the powder and paper were at the beginning, is the whole weight of the calcareous matter, so that its proportion to the whole mass is perfectly ascertained." In this manner, he says, he has examined a great many different kinds of limestone, and has found them vary in all degrees of purity, from such as were entirely soluble in acids, as sugar or salt is in water, to others, that contained only one-twelfth of their weight of soluble matter, and eleven-twelfths of sand.

Were all the stones in the same quarry equally pure, the above would be an unexceptionable method of ascertaining the purity of any limestone; but it often happens, that in a quarry of the very worst quality, there are some pieces found that consist of pure spar, that are entirely free from any mixture of sand; and in other quarries of a better sort, there are often small veins of an impure sort of stone mixed through the rock; so that if either of these should chance to be picked out as a specimen for trial, the result would not be just. Take therefore eight or ten stones of different appearance from different parts of the quarry. Take a chip of each and pound the lot up for your experiment.

And now the subject is burnt out, and after the fashion of an orthodox lime-kiln attendant myself, I feel thirsty, and so make my bow.

Rooks.—Let those rooks alone, boy! Don't you see that they are doing you no harm at all, rather they are doing you an immensity of good? The same instinct that impels the tern to pilot the advance of the lordly salmon up the Thames, has gathered that cawing company to root out the horny-headed pirate horde that is ruining your corn crop. Don't you see how the green blades disappear in a rapidly increasing patch? It is all the work of the daddy-longlegs' bantling. Let them alone! They are your friends, that busy black crowd. There is a sense beyond our ken directs the rook to a sickly pasture days before its owner might know it was ailing; as mysterious to human understanding as that which draws the flocking condor of the Andes, appearing no bigger than a speck on the horizon, the moment a mule falls, to glut himself upon the spoil. Be careful, youngster, with that gun of yours; you'd almost better shoot yourself for your father's sake! 'Tis but a century ago that the extirpation of the native jackdaw from New England, condemned under a like charge, brought about the total loss of the hay crops, through the ravages of the consequently unmolested various insect tribes. As senseless was the reward so many English parishes used to offer for a bushel of tom-tits' heads; whereas these poor smart little fellows did but clear the trunks and boughs of their besetting grubs, caterpillars, anonymous animalcula, and flies.

Those rooks but resemble yourself, my lad. Credited with a varying quantum of mischief according to temptation, calculated to do a certain

amount of positive good. Don't allow him the temptation of the fresh-strewn corn about the turns of the drill, or the potato-sets that have dropped from the basket of the planters. Just at the growing season, and when the young shoot just appears above ground, having yet a modicum of the corn at its root, keep him off; as you had best be kept off from weeding when the plums begin to turn. With the best intention, the rook is undoubtedly weak under over-powering incitement. But when the planted seed has been absorbed into stem and no longer constitutes his food, then be thankful if a legion crowd up and grandly stalk along your fields. Those fearful beaks are doing you inestimable service.

And the small birds again—are they not obliged to import them at any price into Australia? The main part of their food consists of worms and insects injurious to the hopes and food of man. Keep them off your sowing ground for a few days, then encourage their attendance until gathering time comes round, when you may again be profitably lively in your onslaught. So your gain will be greater than your loss.

And here, my young friend, with regard to this same daddy-longlegs (by classic appellation *Tipula oleracea*), let me give you a hint. When you have turned in a clover lay for wheat, under the fond idea so fomented by the modern theoretical agriculturists that this turned-down green meat is passing good for the wheat's development, and one bright morning suddenly you see your crops grow pale—nay, even in parts turn yellow—look alive, there is mischief about

its vital organs, and you have no time to lose. It is now no time for sitting, as the old tragedians made their heroes say. Out with a truck-full from your salt store in the spare stall. Sow it ruthlessly as ever site of conquered city felt. It is your only chance. Before this I have encircled the horde with a narrow deep trench filled to the brim with salt, and then Crosskilled urgently the remainder of the field. What became of them I don't know; at least they disappeared, or rather advanced not beyond to continue their ravages.

Whether they died in the magic circle, or how they got away, I know not. How they come there is thus: Pass your foot along the surface of a clover field in autumn about sunset, at the period when the delicious cool young leaves are just clothing over the scythe-wounded stems, and you will be surprised to see the cloud you disturb of that airy long-legged species, that commence at once insanely bouncing up and down, as a balloon that has half slipped her moorings—if bouncing be not too strong a term for the weird-like footfalls of that frightful dance. They have been busy depositing their eggs. Beware next spring, beware. Turning to the pages of Bishop Stanley's interesting *History of Birds*, it is satisfactory to find this view confirmed: "We often hear persons congratulating themselves on a deep snow, a hard frost, or dry weather, as the surest means of destroying insects; whereas, it is just the reverse. A hard frost, a deep snow, or a dry summer, are the best protection they can have."

And he further pictures the frozen-out rook, in

most melancholy mood, as "to be seen sitting on a bare bough, like Tantalus in the midst of plenty beyond his reach, with his feathers ruffled up, casting every now and then an anxious glance over the hard frozen surface, which it is beyond the power of even his strong beak to penetrate."

This he states to be the period when alone the rook can fairly be accused of a foray on the potato grounds—most assuredly under extenuating circumstances in this case—yet even then you will find usually that, as the oft-libelled Reynard, he is too crafty or too considerate to poach near home.

Here let us rest our smoking steeds, for, as I write, I am astounded by the immensity of new matter that keeps opening upon the view. Just as in ascending a mountain, the higher you go the more extended is the prospect. I thought a nutshell would have contained the subject. Alas! how utterly insignificant is a volume beside it. The very closing up the rivets of what I had ready on hand, has cost me more time than I bargained for, especially as I have had to do it in the intervals of laborious occupation. Farewell, then, gentle reader,

"It may be for years, and it may be for ever;"

but if you find one-tenth only of the pleasure in perusing these notes that I have had in transcribing them for your service, it will reward to remember that we have met.

TIME OF ENTRY ON FARMS.

THE comparative advantages of entering upon a farm in Spring, and in Autumn, depend mainly upon the nature of the farm. The dairy farmer obviously would prefer to enter upon his new taking at a season when he would have the summer grass before him, with the opportunity of raising turnips and beetroot for the winter.

For entering upon a farm altogether or nearly all arable, autumn undoubtedly is the season, as there is the winter before the in-comer for preparing the land in a way that he cannot expect from the outgoing tenant, except under the rarest circumstances.

To the pastoral farmer, whose occupation is the rearing of sheep and cattle, it is of the same clear advantage as to the dairy farmer to enter upon the houses and the grass at Lady-day, so as to have the summer before him for grazing, haymaking, and the growing of root-crops.

What we have to consider, then, resolves itself to the question of entering upon a farm of mixed husbandry, which embraces *all* sorts of farming practised in the country, and which is at once the safest and the most usual mode of farming. In this case also we are of opinion that it is decidedly more

advantageous to the new tenant to enter in Autumn than in Spring.

When we speak of entry in the Spring, we mean an entire entry; as when we speak of an autumnal entry, we mean an entire entry upon the farm at the separation of the crops.

The most *convenient* mode of entry is, doubtless, to come into the houses and grass at Lady-day, and to the land at Michaelmas; or, what is much the same thing in all essential points of view, to the houses and grass at Whit-Sunday, and to the land at the separation of the crop from the ground.

What I regard as the question set for consideration, is that of the comparative advantages of an *entire* entry in Spring and in Autumn. In this consideration, I give a decided preference to an entire entry in Autumn, at the separation of the crop from the ground, rather than an entire entry in Spring, at Candlemas, or Lady-day. Much depends, of course, upon the different customs and practices of different counties; such as whether there be allowed compensation for unexhausted improvements to the outgoing tenant, and what length of time; whether too the straw, hay, turnips, &c., can be sold off the premises, or are left by covenant to the in-coming tenant under certain reasonable conditions. Upon the whole, however, we decide in favour of the superior advantages of entering in Autumn rather than in Spring, and for the following reasons:

I.—Autumnal Cultivation.

Because, in the first place, the in-coming tenant can secure that due culture of the land he has taken at the decline of the year, which is so strongly advocated by Mr. Pusey, and is becoming one of the most important questions of agriculture; to which is due the diminishing of the cost of the turnip-fallow, and the introduction of supplementary crops in our rotation, after the example of the indefatigable and thrifty Flemish farmer. He can be sure of the good treatment his land has received, in the way of being prepared by deep ploughing for the beneficial influence of the frosts; in being also fairly manured, instead of his having to accept the account, often so unfairly made up by the outgoing tenant: as, for instance, there are cases when one hundred loads of manure have been sometimes charged for, which should rather have been twenty-five—dishonest conduct, of which there is too often no evidence to convict the offender. In some counties this knavery has attained to such a pitch that there are men who make it a business to take a farm for the sake (in the language of Surrey) of "working it up to a quitting," and clearing a good balance on their removal to another holding.

By entering in the autumn, the new tenant has moreover the opportunity of adopting that eminently successful plan of improved agriculture, the laying the manure upon the young seeds—a practice which his predecessor might not have chosen or thought fit

to adopt. This, as much else most expedient for the successful treatment of land, the outgoer would find himself too much occupied to attend to, as there is a hurry at the last, even if he were inclined to do it. He has thus, too, the advantage of being able to plough the stubbles up directly after harvest, and of thoroughly exterminating those insidious sprigs and joints of couch-grass, which spread and strengthen rapidly when the crop that previously oppressed their growth is gathered.

"Do you hoe your crops much by horse or hand in the spring?" we remember once asking one of the most successful and neatest farmers in the United Kingdom. "Neither," was the reply; "I clean-pick the fallow so thoroughly in autumn that I have no weeds in spring, and a harrowing sufficiently stirs the soil and lets in the air; while much valuable time is saved at an important season." What a melancholy sight is the green stubble, so fondly patronised by the old-fashioned farmer, whereon the couch is encouraged to grow as late keep for his flocks, by whose dung it, in turn, is fostered to be the pest of future cultivators! How much more tidy, as more profitable, is it to have the stubbles pared and burnt immediately upon the removal of the corn; the surface knocked about with heavy harrows, the ashes covered, and a crop of white turnips drilled in with two to three hundred-weight of superphosphate per acre, to be eaten on the ground; or, at least, they may be ploughed in preparation for turnips the next spring, and this, on light soils is no mean gain; for to work a light soil to its proper fineness of tilth wholly

during the spring is found to deprive the land of its due moisture, and so render it unfavourable to the growth of the turnip-braird; whereas, if it be worked in autumn there is secured an abundance of moisture.

This theory gains great support from the almost universal complaint of the Suffolk light-soil farmer against a clause usually entered in the leases of that county, which obliges him to work his land five times over, even though "it be a blowing sand," when one turning over is found by unfettered tenants ample, and productive of crops, the very semblance of which cannot, under the other system, be attained.

If a dairy form any part of the new tenant's scheme of operations, it will be of vast service to him to be able to put a dressing of bone-dust on his pastures in time to be covered over by the late growth of the year; so wonderfully does this manure conduce to the improvement in quantity and quality of the dairy produce; its effects, when once apparent, being found to last seven, fifteen to twenty years, though not immediately perceptible; it is advisable, for the sake of an earlier return, to apply the dressing at the earliest possible period.

Again, by ploughing for himself, instead of paying the outgoing tenant for his work, the young farmer will save at least what, in butchers' language, we may term "the fifth quarter;" for that a profit is looked for, and not merely the cost price, is certainly the rule.

II.—The Crops.

There is, in the second place, a great advantage in the new tenant having his own arrangement of the crops upon the farm for the ensuing year. It may suit his purpose or his fancy better to adopt a different course to that adopted by his predecessor, —a subject admitting of so great a diversity of opinion now in these days of chemical analysis and artificial manures. We presume him, of course, as every enterprising farmer should be, unfettered by special restrictions, and left rather to his own judgment and fair disposition than subject to the peremptory dictation of his landlord as regards the treatment of the soil to which he looks for his livelihood and credit.

Seed.—By entering upon his farm in autumn he has also the opportunity of selecting his own seed-corn instead of being obliged to trust to the honour and discretion of the outgoing tenant, and so can, with some confidence, look forward to a prosperous harvest. And this is a far greater advantage than it might seem at the first blush; for, trifling as the saving on the amount of seed-corn would comparatively be to them, while the result to their successor is ruinous, still there are men mean enough to defraud the incomer of his due in that respect.

III.—Store Cattle.

Our next argument in favour of an autumnal entry is that, supposing, in this instance, the practice of Oxfordshire and other counties to hold good—viz., that a crop of turnips be left by covenant upon the land, while the hay and straw are allowed to the incoming tenant at a third below market price—supposing this practice to hold good, or that the new tenant has had the opportunity of securing roots, hay and straw, at a fair price, he will have a great advantage in being able to buy store-cattle and sheep at autumn rather than spring prices. It is, in Suffolk, the general practice to buy in, at the fall of the year, a lot of shorthorns, polled Galloway Scots, and Irish Cattle, to be house-fed, fattened, and sold in spring.

In Buckinghamshire, again, the farmers purchase ewes during the autumn to lamb in January and be sold off fat in summer. Thus, during the dark winter months, he may turn over profitably a portion of his capital while he has the opportunity of clearing his way for the spring operations.

IV.—Farm-Horses.

His farm-horses too he may purchase at a considerably lower figure in autumn, when the harvest work is over, than he can in spring. At that time they rise in value on the approach of active field-work, and are often not to be bought at all, unless at

a high premium. The difference in the price of farm-horses in spring and autumn, coupled with the profit the in-coming tenant will reap from ploughing his own stubbles, I consider more than equal to the cost of their winter-keep and attendants' wages.

V.—Manure.

He will also have the chance of being rewarded in the spring by the possession of manure sufficient for his use by keeping all his animals in sheds and yards, instead of having to incur a serious outlay in guano, nitrate of soda, superphosphate, &c., at a time when he has ample calls upon his capital. It is not to be expected, at any rate, that, in succeeding another, he should have the same quality of manure left as he would have made himself; for an outgoing farmer, even if he adopted the plan of feeding in yards, would scarcely supply his stock with the same amount of cake and corn when he knew that he was not to reap the benefit of it in the manure: an argument that gains new weight from the prospect we have now of a failure in the guano supplies, while as yet no convenient substitute has been suggested. We have greater faith, we confess, in dung than in guano, the benefit the land derives from it being infinitely more lasting. What a comfortable appearance has a lawn thick carpeted with straw-manure, as we lately saw at the Prince Consort's model farm, and what promise of abundant sweet herbage does it afford! To meet the objection of those who urge the great expense of hauling out the manure from the

yards and on to the land, we reply, that if the farmer keep the remunerative class of horse he should, he may always have a few spare young ones for occasional use, which will pay their way, if selected or bred judiciously, as well as any of the stock about the place, while he has meanwhile had the benefit of their labour, the exercise contributing to their health and condition.

VI.—Draining.

If draining be required on any part of the farm, though it is the province, strictly speaking, of the landlord to do it, whether free of cost to the tenant, or whether receiving a per-centage on the outlay, as the hauling of the pipes falls upon the tenant, it is of advantage to him to have the winter before him for the work. Besides that, not only are draining operations carried on at the most favourable season in autumn and winter, but there is time for the filling-in to settle and the sod to be rolled down in anticipation of the necessary spring treatment of the land. Whereas, if the draining be only commenced after the tenant has come into occupation on February 2nd or March 25th, owing to the usual difficulty and delay that attends the securing an efficient gang of drainers, it is often with the greatest difficulty, after the most strenuous exertions—if, indeed, it is possible at all—to get a crop of hybrid turnips off the land, be the season ever so favourable.

There are few farms deserted, or from which the tenant is removed, where you will not find that some

land, at least, requires, as is the phrase of Yorkshire, to be "boned and bled:" that is, to be drained, and afterwards have a dressing of crushed bones at the rate of about two tons an acre,—an operation that answers infinitely better when the autumnal growth gathers on the deposited manure—and which thus improved will afford keep for an additional cow to every four acres.

To quote Mr. Caird: "The best time for laying on this manure is in autumn, early enough to admit of a fresh growth of grass to cover it before winter. On seeds which are intended for permanent pasture, it should be laid on after harvest. Its effect is to cover the ground thickly with clover, trefoil, and succulent grasses, in lieu of the thinly planted and very innutritious pink pointed grass which previously occupied the soil. Some farmers told us that it had doubled the produce and improved the quality of their cheese."

VII.—Scouring Ditches.

There is profit, again, in the young farmer being able to have the ditches properly scoured, instead of their being half done by the outgoing tenant, or left altogether, from stress of work, till the second year of his occupation.

Liquid Manure Tank.—Entering in autumn, the farmer can have made at once—whether of clay, as recommended by Mr. Dickenson, or of masonry—one or more of these useful appendages to a farm upon which the fertility of the artificial grasses depends

so greatly; pipes being laid from the cow-sheds, stables, and piggeries, as well as from the centre of the straw-yard, the surface of which should be sloped from each side down to the mouth of the drain in the middle, just as stalls for geldings are paved.

Water-Meadow.—When water is abundant, a rivulet convenient, and the land lying low, an energetic man has it in his power at once to form that most valuable adjunct to a farm, a water-meadow, before the November rain sets in and the season of irrigation comes on; while the fences he may pull down and burn, together with tangled sods of the old banks, will afford a top-dressing of ashes, found by Mr. Pusey so beneficial at the first laying out of his celebrated catch-meadows.

We suppose, of course, the case of a man following an ordinary tenant of the old-fashioned class, that is satisfied ever with what is and has been, and never dreams of improvement. Under any circumstances, however, an active mind will always find room for improvement, every man having his own mode of operation, as he has distinct features and a distinct genius.

All this, and much other work best done in autumn and during the winter season, will have to be done, we must remember, by the in-coming tenant under exaggerated circumstances. It is certainly the exception when a man gives up a farm in fine condition and a cleanly state. More usually the case is, that from circumstances of discontent, or disaster, or shortened means, the outgoing tenant has *removed*; or perhaps under notice from his landlord.

It is not, therefore, likely that the land and premises will be left in a highly desirable plight. When a farm is surrendered contentedly, we may fairly conclude, as a rule, that there is a son or relative ready to step into the outgoing tenant's place, which would make it a matter of comparative indifference whether he came into occupation in autumn or spring. On the whole, then, I am led to the full conclusion that it is more advantageous to an in-coming tenant to have entire entry in autumn than in spring.

To sum up in a few words. A farmer who has come into possession at Michaelmas is in fact, when February arrives, in the position of one who has been long resident upon the ground. He is on terms with his land, and has the satisfaction of being a year sooner in the thick of the fight.

The only substantial argument in favour of an entire entry in spring, is the fact that a farmer can then start *with less capital:* that he will have quicker returns, and be enabled to drift on to the winter, when, if he be enterprising, he will undertake what I have mentioned above as fitting improvements. One year's advantage of those improvements he will, however, lose by the side of a farmer of equal enterprise who has had entire entry in the autumn.

The most convenient mode of entry for farmers generally is, we repeat, to the houses and grass at Whit-Sunday, and to the land at the separation of the crop from the ground.*

* There is one rather important point connected with the Michaelmas entry not specially adverted to by the author. It is, that at that season of the year the land tells the tale of its productive

Hints for Use at the time of Entry.

Without attempting any exact specifications on this subject, I venture to add a few hints of a general nature founded upon a recollection of my own particular need upon a like occasion.

Sale Purchases.—When a man commences farming he will find it his interest to purchase good new harness—good without any elaborate ornamentation merely to please the eye. I was puzzled upon this very point at the sale of my predecessor's effects, but luckily allowed the old and patched up trappings to be bought by a neighbour at prices apparently advantageous. Comfort came at the close of the year on a comparison of our respective saddler's bills.

Machinery.—Let the young farmer purchase too his machinery of the newest make; for in these days of rapid mechanical progress, implements get cheaper often as they get improved; and though there are some which in the course of time are

powers, and of its condition in point of cleanness, in a way which the practised eye cannot very well mistake, or be misled in. The grain is *all* seen in stack, and was probably seen by the in-comer on the ground: the stubbles are open to the eye, and between harvest-time and Michaelmas-day exhibit their state *and tendency* in reference to the weed-crop, if any. In fact, every crop is off the ground; the plough and the harrow have as yet concealed nothing, and the farm is, so to speak, naked to inspection. The argument of less capital required for the spring entry is clearly temporary and fallacious, and, rightly viewed, is an argument against it.—Chandos Wren Hoskyns.

marked by no novelty of construction, it too often turns out that machinery, bought apparently a bargain second-hand, is really dear. In fact, as a general rule in life, and not only in farming, it is best to start with good substantial machinery of the newest approved fashion. It is always the cheapest plan in the end, and often not the dearest to begin with, if proper judgment be used in the selection, and resort be had to a manufacturer of credit. Carts, waggons, tedding-machines, ploughs, harrows, &c., except on rare opportunities, you will not find, unless damaged or of an inferior kind, at a farm sale. For myself, I am thankful that, on the strength of a friend's suggestion, I bought but little at my predecessor's sale, and much of that little disadvantageously: as I could obtain better implements, of more useful modern make, at about the price those old ones cost me. So well aware are the manufacturers of this, that in Leeds there are houses that sell off their machinery every ten years, as they consider the advantage they have in competition with new machinery will more than balance the loss they must incur in the exchange. A tenant removing to another farm, if prudent, will take his best things with him, leaving only the refuse, with odds and ends contributed by neighbours for their convenience, to swell the sale of what he mainly looks to, the crops and stock.

Fixtures.—As regards agricultural fixtures in the strict sense of the word, by an Act passed 14 & 15 Vict., cap. 25, it is enacted that—"If any tenant of a farm or lands shall, after the passing of this Act,

with the consent in writing of the landlord for the time being, at his own cost and expense, erect any farm-building, either detached or otherwise, or put up any other building, engine, or machinery, either for agricultural purposes or for the purposes of trade and agriculture (which shall not have been erected or put up in pursuance of some obligation in that behalf), then all such buildings, engines, and machinery shall be the property of the tenant, and shall be removable by him notwithstanding the same may consist of separate buildings, or that the same or any part thereof may be built in or permanently fixed to the soil, so as the tenant, making any such removal, do not in anywise injure the land or buildings belonging to the landlord, or otherwise do put the same in like plight and condition, or as good plight and condition as the same were in before the erection of anything so removed: Provided nevertheless that no tenant shall, under the provision last aforesaid, be entitled to remove any such matter or thing as aforesaid without first giving to the landlord or his agent one month's previous notice in writing of his intention to do so; and thereupon it shall be lawful for the landlord, or his agent on his authority, to elect to purchase the matters and things so proposed to be removed, or any of them: and the right to remove the same shall thereby cease, and the same shall belong to the landlord; and the value thereof shall be ascertained and determined by two referees, one to be chosen by each party, or by an umpire to be named by such referees, and shall be paid or allowed in account by the landlord, who shall have so elected

to purchase the same." By this most useful and comparatively recent Act, the interest of the landlord is promoted, at the same time that great encouragement is given to the enterprise of an intelligent and earnest tenant. With such fixtures, being permanent improvements, the in-coming tenant should in fairness have nothing to do. There being, however, landlords so short-sighted as to throw all they can upon the in-coming tenant, rather than allow the outgoing tenant to remove what may be essential to, or at least greatly favour, the due working of the farm, it will be well for the in-comer to take such fixtures at a valuation made by unbiassed parties. This we suppose to be done upon the security of a long lease. Upon such a question, however, the in-coming tenant should never have to decide. Such a so-called fixture as a chaff-cutter, which, in the right sense of the word, is no fixture at all—a machine that, on a hundred-acre farm, will save its prime cost in a winter—if in fair condition and good working trim, it would be advisable for the in-coming tenant to retain, as he might have some difficulty in replacing as aptly a tried machine—that is, if he can retain it at a fair price. A thrashing-machine, engine, &c., corn-bins, dairy-fittings, &c., being fixtures in the right sense of the word, it belongs to the landlord to deal with.

Experienced Friend.—Under all these difficulties let the young farmer get an experienced and elder friend to make his arrangements for him—at least to be behind the curtain in consultation with him on the occasion of this his first independent start in life. The novice is apt to be shy, and give way in bargain-

ing lest he be considered mean and covetous (an infirmity of which the man of the world too well knows how to take advantage): and although, were he acting *for another* under like circumstances, he would not scruple, nay rather be proud, to fight that battle for the right which unhappily lies mostly on contested ground; in the case of his own affairs he is apt to be timid, and so "finds too late that men betray." For the rough work then of starting, let the young farmer commission some experienced friend, and wait with calm mind for the result.

Caution.—The young farmer is too often hasty and eager, and there are too many outgoing tenants, as well as landlords, who will nail an incautious engagement or unguarded word. To "keep your own counsel" is safe policy. There is never any good done, but often much mischief, to your plans by blabbing ere you carry them into execution. You are at least certain of being tormented by the unsolicited opposition and advice of a dozen busybodies, who watch you but to canvass and criticise your proceedings when your back is turned. Such, being professed gossips, will shrink away gradually from a demeanour of studied reserve; so that you will have the satisfaction of developing your own undertaking in its bloom. Half the credit of life has its clue in this policy. What a cutting censure on such people was the designation of "the bigot's hole," given by Sir J. Conroy to an open box upon a drain in one of his fields which he was held to ridicule for draining too deeply, through which the water might be seen *pouring* at any moment.

Judgment.—General good judgment is required in farming, as indeed in all other pursuits and professions wherein a man would attain to eminence and wealth; and this is shown chiefly in the doing the right thing at the right time, and the having the right man in the right place. For instance, it would be wasteful to employ your men in cutting firewood or breaking stones for the repairs of the farm roads on a dry fine day when the swedes required drawing, or the wheat-field was shedding its seed.

Forethought.—Again, you should be always looking ahead, or rather, as a celebrated elocutionist used to teach his pupils—"Keep one eye on the passage before you, and one upon the future."

Look out Yourself.—Never leave any important provision to be made by your men. It is no more their place to be concerned about that branch of the farm duties than it is expected of the county chief-constable to take his turn upon "a beat." Not in harvest-time only, but always, the master can do far more with his eye while cantering over the fields, or strolling leisurely through the yards, than by the actual labour of ten pair of hands. For instance, you know by your book when the different cows should calve. See that there be ready gruel, and a horn to give it, so that a search has not to be made at the last moment; with a well-aired loose box, and a dose of salts and ginger to follow a few hours after parturition. The meanest particular should not be neglected: it was by such minute foresight and careful circumspection that "the Duke" won his great name. You will find in his Despatches, after men-

tion of the most important business, an allusion to some myrtle plants he had been requested to procure.

Many an accident comes of a cow's being allowed to calve tied up; not to mention the additional torture the poor animal must derive therefrom in the moment of her agony. See, too, that the udder be tried each morning and evening by the herdsman, when it has once begun to spring, and duly milked as it begins to fill: so will many a cow be spared garget and milk-fever, which might otherwise have spoiled or carried her off. See that she have no turnips or cold water near to gripe her after salts. Precautions such as these constitute a main secret of the farmer's success.

Upon this theme read the eloquent language of Mr. Caird, while speaking of the eminent shorthorn breeders on the south side of Teesdale. "Men are still," he writes, "to be found there who have been bred from their childhood to study the peculiarities of form and symmetry, which, combined with early maturity and great weight, have given the improved shorthorn its celebrity. Seldom leaving home; often the first to see their stock in the morning, and the last to visit them at night; making the health of each individual of the herd a study; and enabled by constant attention and particular management, to encourage the development of such points as they think requisite; while everything else on the farm is made subordinate to the stock—these men have acquired a fame which is the result of such earnest application, and cannot long be maintained without it."

Your eye should be ever on the move to mark that the foals' paddocks have no rabbit-burrow improvised, as they often will be in a night; no open drain or loose stones about whereby to strain a fetlock; no pitchfork or bucket left carelessly beside the shed; no nails or broken bottles lying about; no open hurdles, wherein to entangle and break or strain a leg; to see that their hoofs are regularly trimmed, and no incipient sand-crack allowed to spring; to observe that no gas-tar be daubed near the brood-mare's box, nor any other offensive smell be allowed which might produce abortion; that no savin-leaves be near for her to crop, with an effect equally fatal to your hopes; to see that there be abundant litter in the sheds, so that the young colts' hocks do not get capped in rising from their beds, and that it be fresh to tread on, and not foul and fermenting so as to produce thrushes; to see, too, that no cow be moping or shivering over her food; that there be no yew-cuttings or garden refuse about to poison your herd or pigs. All this, and much more, it should be the farmer's care to notice. Once every day at least, and those who love their farm will never tire of the task, should all the stock be gone over, every animal carefully inspected from heel to horn. It is marvellous how common men, even those who love their horses and their herd, day after day will allow a lame cow or sick horse to go toiling on in misery. "'Tis the master's eye that makes the horse fat," says the old Greek proverb: not that the men will often defraud their horses of their corn; I have never known personally an

instance. But the regular cleaning, the early feeding, the comfort, the keeping warm, the ventilation, must be looked to by the master, or there will some day be neglect.

Time and Locality.—To catch the wave at its turn is the secret of farming, as of everything else; to select that which will pay best in the shape of crops and cattle, considering your locality, and to adopt the course that will make it pay the best. This in Essex and South Lancashire is especially neglected. In parts of Lancashire, where, as Mr. Caird remarks, the very flowers at the cottage door might be made a source of profit, still agriculture is backward and the farmer desponding. In Warwickshire, again, the opportunity of dairying near towns is thrown away. The neighbourhoods, again, of Portsmouth and Southampton are blind enough to allow these places to be supplied with potatoes from France. On the other hand, we remember visiting the residence of a gentleman eminent for his ingenious agricultural discoveries no less than for his prize poultry stock of various breeds. It was an instructive study to notice the simple contrivances by which he had made the back-yard of a small suburban London house serve his purpose to the utmost as a farm-yard. Not less instructive was it to hear the history of his success; how in one year he had cleared 700 guineas by the sale of Cochin China fowls; how, when he noticed the taste to be subsiding, he had sent to Holland for the best Spanish fowl that could be procured, and at that time their breed was far superior to anything in

England; how, again, when opportunity offered, he had fed the market with carrier-pigeons imported from Persia direct. Surely a man of that stamp must deserve to win. Success must, indeed, eventually crown the honest exercise of practised intelligence and industrious exertion. An instance in point is the following:

I remember to have read years ago of a farmer, I think in Kent, who, after an unusually disastrous failure of the hop-crop, was induced to try some cuttings from a plant that grew upon a hedge-row in the neighbourhood, which he had observed to thrive when the cultivated ground presented but a scene of ruin. He succeeded; his plants soon rose to a high premium; he kept up his price, and finally realised a large sum of money. His hops became the favourite sample of the London market. I mention the fact as an instance of the value of that intelligence and quick eye, which I recommend the young farmer most strenuously to cultivate from the first moment of his entry upon his farm. The simplest circumstance will supply to a mind thus trained the germ of a grand discovery.

As Napoleon is said to have gathered his first idea of the celebrated Code Napoleon from the casual study of a volume he picked up when once placed under arrest as a young man—Justinian's Institutes I believe the work was; and as Nelson laid the foundation of his great fame as a pilot in the Baltic while employed as a midshipman to sound the windings of the Thames; so did the project of Bell's reaping-machine occur to him as he was amusing

himself with a pair of hedge-clipping scissors in his father's orchard. In fact, as great inventions are usually of the simplest kind, so do the most trifling circumstances suggest them to an observant mind. Let the young farmer, then, look out; let him travel to get acquainted with stock and places, and men of authority in agriculture; there are landlords in England who will pay the expenses of a tenant travelling with that view, so well do they know the ultimate benefit such a course must bring to themselves—the tenant—and so perhaps eventually to the noble science of agriculture itself.

Whoever aspires to be distinguished in any pursuit or profession must have his eye and ear ever on the alert to select the wheat from the chaff of knowledge that is thrown out, as well in books as in the conversation of the so-called "men of the world." The points of useful information he should note, and never afterwards forget; there is no knowing at what time they may be inquired after in the market of life. Witness Sir Joseph Paxton, who was picked up as an under-gardener at Kew, by the Duke of Devonshire being struck by his unusual intelligence: the man who subsequently, amidst the hubbub of a railway board, of which he was a member, sketched upon a piece of blotting-paper the world-celebrated plan of the Crystal Palace. Witness, again, George Stephenson, whose first essay in life was his undertaking to clear of its flooded contents a coal-mine which had been despaired of by more practised hands. The proprietor casually overheard him express an opinion that he could drain it, as he

stood in sorrow amidst the crowd of lookers-on. Stephenson accepted the challenge thrown out to him, cleared the mine in a shorter time than could have been imagined, and from that day was a made man.

To return, however, to the more direct line of our instructions, the best hint that can be given to a young in-coming tenant is, to start forthwith in the determined prosecution of the field-work, autumnal or vernal, most especially required at the season. (See "Calendar of Operations.") We presume him, of course, acquainted with the practical details of all farming operations; in other words, we presume him to have passed his agricultural apprenticeship; for to enter into such an explanation would be to fill volumes, not an Essay. The best advice to a young tenant, then—his stock, implements, &c., having been purchased—is to "take time by the forelock," and to start with what most requires doing at that particular season. He should not be clipping fences (though that in its place shows good farming) when the weather allows and there is land to be ploughed. As the credit of the mason depends upon his selection of the fitting stone, and the true line in which he places it, so does the success of the agriculturist depend upon his judicious decision of what is to be done next, and his seeing that it is properly done. A few rough general hints I will subjoin here, without regard to their connexion, as that can little matter.

Old Pastures.—Beware of breaking up old pastures, even if corn be dear as in Pharaoh's time, and

though you have your landlord's leave. Pasture for milch-cows can never be too old; and if you fancy it has grown feeble you can always refresh it by harrowing in the spring, some manure, and a dose of "renovating seed." To break old pasture up is to kill the goose for her golden eggs. Many is the farmer in Gloucestershire that bitterly rues his precipitation in adopting that plan.

Selection of Implements.—Catalogues, with full details and amply illustrated, are now so easily obtained by post from any one of the numerous makers, whose advertisements appear in the pages of the Agricultural Journals, that the young farmer will have no difficulty in making a good selection. Let him, if he have the opportunity, consult some intelligent modern farmer. Too often, however, he will not have this opportunity, or his friend may be loth to advise. In this case let him weigh carefully the respective merits of the different implements as described and drawn in the catalogues, if he have not had an opportunity of visiting some one of the great shows, where the makers are always to be found, and he will readily be enabled to select what he wants. Economy, however, let him strictly observe; at the same time that he should be forward to purchase every implement that is really of service to aid or shorten labour. A good sound article let him purchase of the plainest form consistent with substantial neat workmanship. The man who studies for himself is far more likely to be well suited in the end, and at a lower rate, than he who consults merely the show-room, on market days, of

the local dealer in agricultural implements, who is naturally anxious to dispose of what he has on hand, and who is not always a man of enterprise or an unbiassed witness.

Buy as you want for your immediate use, and no more—for instance, on entering your farm you must have horses, harness, carts, ploughs, harrows, &c., store cattle, and sheep proportioned to the turnips and other keep, either left by the out-going tenant by fixed covenant, or secured at a fair price: the cattle and sheep being sold fat in the spring at a good profit, will provide you with funds for the purchase of spring tools; a roller, crusher, &c. &c. in aid of your stored capital. My idea is, that no farmer can do justice either to himself or his landlord who has not *ample* funds to commence with, so as to be able to provide himself with the best of all he needs; while by paying ready money he not only has a check upon his expenditure, but will save the value of a cow or more in discount allowed for cash payments.

I am perfectly aware that it is the too-frequent practice to start in the agricultural line with limited means, or at least such as are just equal to a partially fair but not first-rate treatment of the soil. This practice cannot but be blamed, beside the practice of those who measure their taking by their purse, and leave themselves an ample balance in hand. Exceptions there are, of course, to every rule; but generally speaking, what we advise is the safest and most satisfactory plan. Whatever be the extent of the lease the true policy of the in-coming

tenant must be to grapple with his land as soon as possible; to have his vessel trimmed and fully manned before he leaves the harbour, and not start with an insufficient complement, intending to pick up an extra hand or two at the various ports where he may chance to touch.

Seeds.—Select for seed-corn the best sample you can find, even though you have to pay a few extra pounds for it: when harvest comes you will be more than amply repaid. For your other seeds, mangold-wurzel, clover, turnips, rye-grass, &c. &c., employ some respectable seedsman, the ample details of whose catalogue you may leisurely study; or if you be at fault, state simply to him your need, and he will select for you perhaps better than you could do yourself. For any seeds but seed-corn trust not the skill of your neighbours, for you will probably have to pay far more than you would to a man who makes the ripening of seed his special vocation; whose character and interest are staked upon the quality of his supplies. A frequent cause of the failure of the clover crop is undoubtedly the use of seed imperfectly ripened at home.

Local Traditions you will often find useful. What suits one description of soil or climate will not answer in another. Every country has its variety of local practice, which the scientific farmer will be able to decipher, and adopt the best parts of. Study, therefore, and learn to listen patiently to an account of local usages and practice, which may serve you well some day in combination with your otherwise acquired general farming knowledge. Drury

or their condition will waste again even faster than it grew. I assume, as is my private belief, that all grazing on water-meadows will rot a sheep. The moles, if in excess, you must look after now upon the meadows. A moderate mole contingent is an advantage, probably as tending to exterminate the wire-worm. I should like to see a good essay on the disputed claims of this animal. Look carefully to your yeaning ewes, avoiding, above all things, a wet yard for them. Mind, too, that you do not overcrowd them, or you will have smothered lambs, and an enfeebled flock.

What sheep want is a *dry* retreat. Cold they do not mind. Mares will be foaling; give the nursing mother plenty of bran mashes and boiled beans, there being nothing like beans for producing milk. Bean flour, however, in excess, induces a tendency to humour in a horse, which breaks out usually in the shape of mallenders. Ten days after foaling, put the mare to the horse again. Take advantage of the remaining cold weather to kill and cure bacon: but it will not do to cure during frost, young housekeeper. The sows should be farrowing now: a mash of oatmeal and steamed potatoes is capital food for young pigs. Have your cart horses kept in spirited condition: note at once and reprimand the least slackness on the part of the feeder. The first hoeing of the wheat will soon commence. It is a plan that some object to, as being very expensive, and unless most carefully done, weakening the wheat considerably by the severance of rootlets. Land, carefully cultivated in autumn and under roots, will

have little foul growth left to complain of in the white crops. Sow the first succession of vetches for July. Keep the roller at work on the wheat and grass lands. Have your hen-house swept down and well and neatly lime-washed. Keep the nests clean, and procure a change of eggs to guard against deterioration in the size of the fowls from in-and-in breeding. Get your carrots sown on land deeply ploughed and manured in autumn. If your land be not so prepared, manure now and plough in shallow: or sow land on which turnips have been eaten off. Be careful to give more hay with the turnips, as they are apt to be laxative this month, and a sheep is soon gone when internal pain comes on. Bush-harrow the meadows you shut up for mowing. To drag them with heavy harrows is capital practice: it will often double the crop if a dose of guano be given on the first succeeding wet day: but without guano this rough treatment does wonders.

April.—This is a month of earnest activity for the agriculturist. He must be quick and get the remainder of his spring corn in, barley, and April wheat. This latter yields but scanty straw, and as a rule barley will bear a stouter stem and finer head, for having been sown a month since. There is a great breadth put in, however, during April, even to the end, that answers well on light rich loams, if there be sufficient moisture in the ground to help the germination of the seed.

It will do to sow flax too even till the latest week; but let the carrot sowing be soon finished.

It is a good plan to mix the carrot seed with moist sand in order to start it some time before you want to use it, as it remains long in the ground before it sprouts. Mix it with fine ashes to drill in and a taste of artificial manure. Otherwise it is apt to elude the circulating cups, and you will be disappointed in the regularity of the crop. Some sow carrots in alternate rows with turnips. The early potatoes will now be struggling into light with crumpled leaf on their thick ancled stalks, which accept as an intimation that you must set about planting the main crop. Have beds of kohl rabi and cow-cabbage sown for setting out in May. Invaluable to the sheep farmer is the latter vegetable about the end of summer.

Put in vetches at intervals of a fortnight if you fear a deficiency of the artificial grasses. Happy are those who have this month a tract of alluvial meadow, that the winter floods have dressed, with its thick succulent produce so excellent for all stock but sheep, which there is danger of its rotting. Even after it has been mown for the use of the fold yards, this Nile-like land will grow a second crop in time to come in with the hay; which however it does not improve or even harmonize with over well. Its excellence is rather of the sugar-cane sort; better to suck than to eat dried.

You will sow your artificial grasses and clovers now. Let the seedsman know the nature of the soil you mean to plant, so that he can suit his "mixture" to it, for some grasses will flourish where others die away. Deserved attention is paid to this point (so

wonderfully overlooked until lately) by the more eminent seed firms.

The meadows intended for hay should now have been handpicked and rolled smooth in damp weather; a process that thickens the crop while it obliterates the main impediments of the mower's scythe.

The straw in the rick is getting dry now, and when chopped for the stock should be allowed to stand some extra hours mixed with pulped roots to give it flavour. What turnips remain upon the land should at once be pulled, as their sprouting is a serious unnecessary tax upon the soil.

Sow white mustard and saintfoin; this latter (most precious keep for sheep) requires a lime soil, into the crannies of which rock it winds itself down with the ardour of a geologist.

Hoeing and weeding will go on this month; as well as top-dressing with gypsum, guano, &c.

The horses must be kept up in condition, as hard exertion will be demanded of them now, and their condition is naturally softer as their coat changes. Above all things have about them men who like horses (for labourers all vary in special tastes), or they are sure to come to grief. There is an inborn inclination requisite in the groom, no less than early instruction. One will keep (under greatly the same circumstances) his horses sleek, sound, and active, where another would spoil, or reduce them to a *facsimile* of Mr. Thorley's celebrated, "There's something wrong" steed.

This being a transition period between the old and

new keep, the flock will require much artificial food —oats and cake—to keep it thriving. Usually at the end of this month mutton has a tendency to fall in price; a rule that will scarcely apply to this unhappy year.

Mares will be foaling. Don't spare the juiciest food you can obtain; a shrivelled youngster never comes to any good—calf, pigling, lamb or colt. Get plenty of calf-meat on, and keep it there, is the secret of profitable stock-farming, of well-sized hunters, as of marbled beef.

From the middle to the end of this month is the season for sowing and planting what are called, the manufacture plants—woad, madder, flax, hemp, mustard, &c.; oil plants, as rape, poppy, and such plants as are grown for medicinal purposes, or peculiar uses in domestic economy, as rhubarb, liquorice, buckwheat, cress, &c.

The cows should be now in good order for calving; and abundant broods of all kinds of poultry should occupy the housewife.

Roll the spring corn when the weather allows, and feed down too luxuriant wheat with sheep.

Of the red clover I omitted to observe that 7lb. to 8lb. per acre should be sown; the thicker the plan, the finer will be the stems; it does better on soil manured for barley than when the manure was applied to the previous crop of turnips.

Supply the young cabbage with an abundance of liquid manure, of which it is greedy as an Aylesbury duck. Sow mangold wurzel. Having dressed the ground with six cwt. per acre of salt (a treatment

that delights this plant, being of sea-side origin) deposit a good dressing of dung wet as you can in the drills, which, having covered with the double-mould-board plough, leave for a few days before sowing. Otherwise, when land is ridged up and sown at once, the wind and air dry the soil so, that the seed has no time to congratulate itself upon its drink before it is withdrawn, to the sad prejudice of the plant's growth. Ridge it up, however, and let it dry; the moisture will gradually reascend after a short absence, and seed, then sown, will not be disappointed of a regular supply. It is well to start mangold wurzel seed on the granary floor before drilling it in, which we usually do with a combined seed and manure drill; down the lower-set pipe of which damp ashes and superphosphate (4 cwt to the acre) lead the way; and which are slightly covered by the mould that falls after the first pipe's passage, so that seed and stimulant don't come quite in contact; else might there be a fatal issue.

Check the ravages of the wire-worm by sowing salt and soot, and hard pressure with Croskill's or Cambridge's roller.

Sow lucerne in drills, having trenched before, if you want fine cuttings. Finish laying your fences, as the wood will now bleed, and the hedger will be wanted to help in planting cabbage, potatoes, &c. Fat lambs will fetch high prices. Easter lamb is an institution. Get clear of your porkers before the warm weather comes. Paring and burning may proceed. Spread the ashes, harrow them in, and roll. It is an excellent plan to pare any poor grass land,

clay if possible, or mossy orchard, that you have, and store heaps of burnt stuff against the winter when you can let your store pigs spend the night in a spare bay of the barn upon a bed of it, spread afresh daily, and slightly covered with chopped straw. It is surprising what a quantity of strong stuff you will so accumulate to drill in with your turnips. It is the excessive purchase of artificial manures, and indulgence in superfluous labour, that eat the heart out of the farmer's profits. Look well after your men, doing as much as ever you can by piece-work (a plan which gives them courage while it saves you from care,) and make as much manure at home as you can. A slight powdering of its own roasted coat and a few grass seeds will soon bring a better sward back where you pared. In fact white clover would come of itself. It is singular that this valuable plant immediately starts up where burnt stuff has been deposited.

Clear out yards and boxes and build a heap to rot for the swedes.

Finally begin to stock the pastures that have upon them some covering of old grass, which will now be palatable from the young shoots which its shelter has forced. There will be but a scanty bite else upon the pastures (to graze which, when too fresh, would be as bad for the field as for the stock) until about the 12th of May, when the dark bud of the ash, most diffident of trees, has burst.

May.—It is now time to top-dress the spring corn: a process, however, that in the northern

counties is deferred as late as June. Much depends on local experience, a sure guide that should never be neglected. The stuff to be used you may easily determine from the prospectus of any eminent manure manufacturer. Beware of inferior firms: by inferior, I do not mean necessarily small or young firms, which in time may come to rival the largest, if their production be honest on analysis. Still, manure companies have been caught tripping; their opportunity being great, while the result to the farmer is most disastrous and disheartening. Our own private theory is, that if the root bed and the clover ley have duly received the right rich coating of muck which they should have had—muck, that is, of cattle well fed from folds, the juice of which does not drain away in a porter-coloured stream, such as is the ensign of many a small occupation which can ill afford it—then there will be little call for outlay in the purchase of what is, after all, found but too often a precarious stimulant at best. Here, again, let me repeat that it is the excess of the labour and artificial manure items in his balance-sheet that too often sink the farmer's profit. Now-a-days, to make agriculture pay, there must be on the holding a smart staff of skilled and reliable workmen, aided by the best machinery of approved usefulness, and backed up by an annually heightening manure heap. The stock, I need scarcely add, should be of a quality as good as can be, and the seed for sowing choice. You can on damp days cart out dung to build a manure block for turnips, adding salt to each layer if you suspect grub. Do not forget to put a sub-

stratum of ashes or dry earth to absorb the drainage, nor to cover over the top with soil a foot deep to prevent its goodness being dried up by the sun. I like best the plan of having excavated yards, well cemented, from which you haul out the juicy stuff, an accumulation of months, all reeking wet, into the opened drills, which should be closed upon it as fast as spread, so as to save every element of moisture for the refreshment of the rootlets.

If your residence be on the sea-board, and you have the ocean weed to dress your land with, by all means let it be ploughed in fresh: never dream of putting it to ferment in heaps. Be busy now amidst the pea and bean drills with your hoe. The hot sun will scathe the saucy weedlings, while the ground gathers moisture quicker for being well pulverised. You can sow lucerne this month on a clean, rich bed. Only to-day I saw a field all but ready to cut of this inestimable fodder, in its fifth year, and apparently stronger than ever. It has been, however, well cleaned and manured every season. Fallows should by this time have been thrice ploughed according to the old system—once before Christmas and twice subsequently; they should then have been well harrowed, and have had the weeds picked off. In this preparation of the fallow, however, the steam-plough where the land allows of it being used, has caused a revolution. Steam-ploughed in autumn, the scarifier alone will suffice to work it in spring, the rents of that remorseless implement having given ample opportunity to the soil of inhaling the winter through the fresh reinvigorating air, even to the

by hoe, and fork and salt, and spud, for they spread by millions to occupy the food and room of corn. In Australia or America—I forget which—there is a scale of fines inflicted upon those who allow weeds of various species along their lanes and hedges—a thought worthy of a statesman. Hoe potatoes, carrots, cabbages. Dig newly-planted hop-grounds. Towards the end of the month hoe and thin the mangold wurzel. Transplant in moist weather to fill blanks. If you have litter left, soil your cattle as much as you can in the yards; grass cut and so consumed goes as far again as it would fed off. It has been estimated that "a field of meadow in good heart, mown and eaten green, will at a rough estimate, produce treble the quantity of milk it would have done if pastured, and four times as much as it would do in the form of dry hay." In the fields that you do pasture, see that there are not wanting for the health and comfort of your cattle, water, shade, shelter, nor rubbing-posts—a luxury which it was the first thought of the kind-hearted Sydney Smith to erect when he took to the cultivation of his glebe.

Take the sheep off the water-meadows and shut up for hay, having first indulged them with a good drink. If you feed them off, you will rot the flock; nay, do not even soil sheep with the grass mown off them. Plough up the rye and vetches ground as soon as cleared, and have the roller to follow the plough to keep the moisture in. Put the mares to horse so that they may foal down to spring grass. It *is now* a good time to form water-meadows. To-

wards the end of the month sheep-shearing in the main will set in, housed sheep having lost their fleeces a month back. They must be washed a week or ten days before they are clipped and turned to dry upon a fresh meadow where they cannot soil the wool again. Ten days' perspiration is requisite to restore the yolk to the fleece. The shepherd must now be incessantly on the look-out against the insidious inroad of the fly. This is a favourable season for paring and burning with a *slow* fire any weak or mossy turf that you can find, and hedge-side trimmings that you may accumulate. The ashes should be stored under cover and used next winter to bed the fattening pigs with in a bay of an old barn, a plan that will save you much expense in the shape of artificial manure. Clean your young hedge-rows of the coarse grass and weeds that would else soon choke and impede their growth. Plan out the drains you may require to make next, as the springs are now more apparent than hitherto upon the surface. Oak-stripping commences; see that the bark is kept set up, and that there are plenty of hands, for the bark is in its prime only for a few days. Commence sowing swede turnips; the early sown produce the most certain and heaviest crops.

By early sowing the plant gets in advance of its insect enemies, and time is allowed to replace failures. Plant out cabbages in ground manured and ridged as for swedes, setting the plants from two to three feet apart. A most valuable help to the development of your flock in the dry months is a plentiful supply of this succulent vegetable. Rape

and turnips for autumn keep, preparatory to wheat, should now be sown. On early soils the artificial grasses will be ready. Lucerne will afford a succession of cuttings through the summer. Handweed the flax by means of women and children, who go across the land on their knees facing the wind, so that the bent plants may be blown upright again. The hedger and labourer-of-all-work should now have finished with the roads, fences, &c., and should be ready to help at getting in the crops.

And my task, too, is done; and, as the young May moon is shining, I shall just stroll out in the perfumed night-air, and listen to the rooks there murmuring, as it were, thankfully in sleep beneath the mysterious canopy of heaven.

June.—

> "I oft since then have watched the moon,
> But never, love, oh! never, never,
> Can I forget that night in June,
> Upon the Danube river."

For "love" in this extract from the well-known popular song, write "bailiff," for "Danube river" put "meadow gate," and imagine further that we are watching the cloud rack drift across meek Dian's crest in some considerable mood of anxiety, having engaged a gang of mowers to commence upon the grass to-morrow. Pre-eminently is June the month of haymakers, and prudent is he who has shut up his meadows sufficiently early in the spring to allow of their having a good swathe upon them now in flower, the sap of which has hardened enough to afford a

keen cutting for the scythe. Now there is the best chance of getting in a fragrant, toothsome rick for the pet stock, for in July the weather is apt to be wet and stormy, and the August growth will have developed too much of woody fibre for the hay to be equally nutritious with that earlier saved.

Do not suffer your first crop of "seeds" to stand too long, or you will feel it in the second; keep weeding the wheat, beans, peas, &c., which will soon be too high for you to invade without trespass. Cart out as fast as possible wet muck into the drills of the swedes; spread and cover in at once, the too general practice of spreading and leaving it to dry upon the surface, the salts evaporating, to a chip before it is turned in, is simply suicidal, and as great a drain as can be conceived upon the profit of the farm. A considerable additional supply of manure should be made now by soiling stock in the folds, as well as by paring and burning the headlands of the fallow, where the importunate couch from the fence shall have forced its way, as it will do, carpeting rapidly all bare space. This burnt earth convey away at once in a dry absorbent state to any large shed, where you can feed a score of swine upon it, allowing them abundant vetches, with some grain, and what slops the house can afford, not forgetting a trough of fresh water at one end in which they cannot wallow. You will shortly have many bags of rarest stuff to drill in with your later turnips.

Furze seed that you may have overlooked may still be sown. After vetches put mustard, to be eaten down in August and September, before flower-

ing; it comes sooner than the turnips, which are otherwise a better crop; sow 7lb per acre broadcast. The flock will require careful watching and incessant investigation, for the fly is upon the wing, and the writhing maggots soon play havoc with the unhappy sufferer. Hoe the carrots and potatoes and weed the flax. Tie the hopbines, pruning them where needful.

Hoe young lucerne, a crop that weeds will readily daunt. If you have the chance of filling them again, you can now clean out your ponds. Otherwise leave them until towards the winter, when the leaves have fallen. If you graze your cows you will find it best to keep them in by day during the great heat, turning them out as the sun declines, unless there be good shelter in the pastures. It is a good time to plant holly hedges, protecting them by hurdles, and dressing with chalk. Burn lime this month; mix dry lime and salt together for your wheat, two bushels of lime to one of salt, and protect the mixture from the weather. Look to your bees; they are about to swarm. Hire harvest men; overhaul your implements and supply gaps. Beans will soon be in bloom. Horse hoe the mangold-wurzel, thin and hand-hoe. Single the carrots and parsnips to intervals of about eight inches to a foot, and repeat the hoeings throughout the summer. Continue planting out cabbage in a rich highly manured soil; planted now, or early in July, they will be useful food for winter and spring use; horse hoe and hand hoe deeply, as long as there is room between the rows. Hand or horse hoe buckwheat towards the *end of* the month. Hoe chicory towards end of

anticipated years ago, by the use of common sense and observation, many points of agricultural practice which have since been put upon the base of science.

Purify Premises.—At entry, have every stable and cow-house, every rubbing-post and shed, thoroughly cleansed of all possible infection by a good washing with a solution of chloride of lime. You may so escape many a dangerous or troublesome disease, such as glanders, scab, &c., the seeds of which would otherwise have been lurking for an opportunity of communicating their contagion.

Thin Sowing is by some, as by Mr. Mechi, warmly advised; by others, as by Mr. Beasley, condemned, because "corn should not be encouraged to tiller. If the plants are sufficiently thick in spring they at once send up the stalk; but if the roots are thin they send out lateral shoots, which strike in the earth and produce new plants. The first plant is weakened by having to produce auxiliary plants, and the plants of the second growth do not come to maturity so early as the original or parent plant. The quality of the crop is thus injured, as there are always more light and defective corns in a thin-sown than in a thick-sown crop; besides that there is less seed to meet the contingencies of wireworm, grub, or very severe weather."

Hoeing on a light soil increases tail-wheat, and without immediate rolling to follow there will be a great deficiency of crop. Others are of opinion that hoeing cuts the small fibres of the wheat and lets it fall. I have adopted with success Mr. Beasley's plan of sowing at intervals of 4 and 14 inches, making 18

inches between the two outside rows, exactly as when the rows are 9 inches apart; thus:

The 14-inch intervals are thus caught and cleaned by the horse-hoe, while the plant escapes all risks.

Wages.—Pay your workmen on Friday in small silver; the poor fellows will then not have to enter a public-house or shop to obtain change, where they are always expected to spend some portion of their weekly pittance in return for the accommodation.

Much else might be given to the young in-coming tenant in the way of suggestions. What I have written I have drawn from the recollection of my own difficulties on entering as a young farmer; and if there be anything in what I have penned that shall encourage some youthful ardent spirit to explore the yet undiscovered seams of a glorious science, which is still in its infancy, my labour will have been amply repaid.

CALENDAR OF OPERATIONS,

BEING INTENDED RATHER TO REMIND THAN TO INSTRUCT.

January, from too usual experience, we must assume to be an inclement month, with a terrible rain-pour most days, and threatening skies of sleet overhead, with their consequent slush-pools under foot, and which work a generally depressing influence upon man and beast, so that it is all the farmer can do to keep his craft forging ahead at all.

Ploughing will be in a great measure out of the question, for it were simply ruination to trample the clays (they should have been finished, where possible, before winter, so as to allow of their thorough aëration by the action of the frost), while the light mellow loams, so favourable to barley growing, are messed up every twenty yards into a sort of impromptu quagmire, such as betrayed poor Sir W. Ponsonby at Waterloo to the mercy of a Polish lancer, and which makes our thorough-bred tread nervously with the action of a cat that has been launched upon the oil-cloth by "young hopeful" with her feet cobbler's-waxed into walnut-shell pattens. Still every opportunity must be seized to press on with the ploughing of the sheep-folded land.

Every dry or frosty day must be industriously devoted to the hauling out of manure from the yards and boxes on to the turnip fallows (the stubble of which was scarified or pared just after harvest, so as to subject to the hot September sun, for their destruction, the surface weeds, and such seedlings as might be tempted to awake in the soil), or on to such young clovers as could not be dressed, when they should have been, in autumn; while in the field that is intended for mangold a square muck citadel will be erected upon a deep absorbent bed of accumulated ashes, sawdust, leaves, sieved road-scrapings, and such like, which, turned over duly, shall ultimately yield the soapy, dark residuum that it delights this plethoric root to batten on.

The headlands of the meadows, just where the cattle are prone to congregate for shade from the noontide summer heat, and the ewes in lamb to make their nightly resting-place, ought to be ploughed up deeply, three yards wide from the fence, and the soil well mixed with quicklime, in the proportion of a bushel to every cubic yard of earth, so as to form a top-dressing after hay harvest, and a right good producer is it of Dutch clover and the trefoil tribe at large.

Tiles can be fetched for such draining as may be required, green spots now marking the springs upon wet land; whilst coal, timber, stones, slates, etc., for the inevitable repairs or extension of the homestead, will form the back journey burden of the waggons that take grain to the station.

Lime, too (care being taken to avoid the magnesian), will be hauled for the mixing of compost heaps, and to

dress such lands as have not felt its influence for at least seven years, and so may be presumed to have accumulated sufficient inert vegetable matter for it to bring into beneficial action; one cartload being stored under cover for mortar, whitewashing, etc., as occasion demands.

It may be again as it has been of late years, that a morning will dawn darkly through drizzling rain such as were enough to give anyone the blues, even with rinderpest imminent and low wheat-averages existing, if one could afford an hour to fret. Blessed provision that we cannot! and after all, my lad, there's good in everything. Don't be grumbling so over-much, to the disturbance of your liver: for yet you must remember that this accumulated rainfall will bring the springs home, a fact we may be thankful for in July should some comet indulge us with an oppressive visitation.

There is clearly no out-door work to be done, so while the teams are being cleaned and fed, and the stockmen hasten on their rounds, you can oil and test the fixed thrashing-machine in the barn, so that, by the time the driver has hitched-to and mounts his unenviable central circulating perch, you can be ready to begin at once. Round steps the steady team under their extended shed—rattle, clatter, go the cogwheels and machinery when their feeder stuffs down its greedy maw the great forkfuls of barley that two hands pitch from above, while the bailiff calmly rakes back the discharged straw for another batch to stow away, and exhibits a quick-growing grain-heap underneath. I do so like to watch the steady

march of a machine—no incessant call for beer—no pipe to suck—no weariness of purpose—but onward (barring human accident) an unflagging production of solid work. It makes you jolly, despite yourself, amidst the gloomiest weather.

On wet days, when there is no thrashing, chaff-cutting, or corn-crushing required, there is the cart-harness and gear to overhaul, that get so dry and crack if neglected long; so the wash-tub must be brought, and a good lather of soap and hot water prepared; then as the lads unbuckle, soak, and scour, the men scrape off the accumulated scum, dry, and re-oil, until the whole set looks quite smart. A little trouble taken in this way on an occasional wet day, is a considerable check on the saddler's Christmas account.

Then there will be fire-wood to saw, and the buildings to sweep down inside and whitewash, cart-wheels to grease, etc, so that the place will wear quite a bright new look when the sulky sun comes out again.

But if the morning after all shall clear, then, having seen a good start made with the thrashing machine after dinner, be off (and best if you can upon a swift Welsh mountain mare) to take a round of the fields and the far-off buildings.

The drains you should find running bravely into their outlet ditches without hindrance, the hedger having been before you with hook and spade clearing away all obstruction of bramble, sedge, accumulated soil, &c. Soon you reach the distant yards. What a right comfortable sight is a well-

littered fold! How it gladdens to watch and stroll through the calm tame milch cows so leisurely chewing the cud after their nightly feed of cut hay and roots, just sprinkled over with a taste of meal, or picking a sweeter lock from the clean straw that has been shaken out for their bed, while the sleek "Black Diamond" porkers repose cosily, half buried at a corner of the shed, excepting here and there one which has been awakened by the kick of a coquettish heifer, and thinks it best accordingly to improve the occasion by rooting for what the flail may have left before his brethren stir.

How earnestly, amidst the winnowed chaff, doth chanticleer scratch, chuckling meanwhile to his helpmates to look out, his labours only arrested at intervals for him to re-echo with lusty bass the jubilant cackle of a distant newly-delivered spouse. In the gutter, meanwhile, are the ducks spooning up an aldermanic repast, or daintily nodding upon the pool, and quacking the preliminaries of an early intended marriage. You will leave the bullocks in their boxes, after just an inspection to see that they have been duly groomed. That they are thriving will be clear from their contented look, moist nose, and a dew of perspiration hanging in beads upon their curly coats, so as to quite wet the hand that would investigate their increasing obesity. But though it delights to count the golden coin those beasts will certainly bring in if lucky—superlative for turnips as is that solid muck, well trodden under foot, and never stirred from the time its first element enters as cut straw until it is carted to the field as

plum-cake for the swede rootlets—it is that part of the farming business for which we have least inclination. Let us turn out then upon the meadow where there is a thick carpet of what the herdsman terms "fog" or "ruffage," in fact a long bite of old grass through which the young blades quickly spring with their bright green dainty points, as you may see the peas do in your garden between their walls of matted fern.

February.—On this meadow, clothed with "fog," but on which every week, now that January is gone, will begin to tell a tale, we have had a batch of heifers in-calf running out the winter through, except on such days as the weather was too wet and boisterous, when we treated them with a visit to a rough gorse-built shed and yard, enclosed with fir poles, in the corner of an adjoining pasture, under an aged oak, where there had been built alongside, in anticipation of this use, a small mow of rough hay, such as was comparatively worthless in the stack-yard. It is surprising how much better they do thus than when we used to confine them within doors. Kind nature has provided them with a top-coat of long soft hair, that looks as if it could repel the keenest cold; anyhow they do remarkably well on the open, getting just a small armful each of hay or sweet oat-straw every morning, (given at night we found they only toyed with and wasted it), and a load of white turnips carted out for the lot about noon and thrown whole upon the ground. The white turnip is not found to choke cattle, when thus

thrown to them uncut, as the swede often would. Being of a softer nature they manage to bite and chew it without risk. Their hay and roots are given to them on a different spot of the pasture every day, as they are apt to stand about and take their siesta close by after feeding, so that the field gets gradually a strong dressing as well as a regular trampling, which tells famously in the hay-yield when the meadow is mown. I quite understand, as I once acted on the theory, that it is better all dung in winter should drop upon the strawyard, the contents of which, being duly carried out and regularly spread, would render uniform benefit to the whole surface of the grass land. It happened, however, that we were bound to feed one field for two years as we have described above, and it "never forgot it," as our bailiff somewhat graphically remarked. On reflection, it occurred to me that a field thus regularly fed across gets, after all, most evenly manured, for you will observe that it is long before the rank growth of grass that springs where the busy rook has scattered the dung-cake in his search for grubs, becomes palatable to the grazing herd. They dwell rather on the milder-flavoured grasses, which so, in turn, get their dose of undiluted droppings too. A field thus dressed obviously imbibes a more abiding manurial essence, so to speak, than it could from a carpeting of fold-yard muck, the best elements of which have been too often washed away by the rains into the porter-coloured fold-yard pool. But to return to our heifers; of course, if any one seems ailing or weak we bring her to the strawyard

at night. As a rule they do better out, when there is plenty of food and the soil is sufficiently dry to prevent their "poaching" the surface with their feet. If you look from your bedroom window with the dawning light, whether in summer time or winter, you will see the cattle most industriously grazing. At this hour it is said by graziers that the herbage has an extra virtue in it, just as in proud man's case the hours before midnight are reckoned to afford more refreshing rest than those later on. As the appointed term for man's "beauty sleep" is before the ghostly dead of night, so for cattle the best feeding is with the waking morn.

It is worth your while, young feather-bed farmer, to get up occasionally and watch your stock's real enjoyment at this hour—

> "So early in de morning,
> Before de break of day."

You may so anticipate the mushroom marauder, and be repaid by a delicious stew at breakfast. It would stir your rustics too amazingly to find "the maister" among the kine, when they were crediting him over their cutty-pipes with a couple of hours' more sleep than they could have. There is a tale told of an old-fashioned farmer of that opposite sort the "we wont go home till morning" school, who, finding himself at length debilitated in health and pocket, had the sense to determine to pull up, but not knowing how was superstitious enough to consult the local gipsy fortune-teller. With native shrewdness that olive-cheeked matron, having secured

her guinea fee, delivered him a charmed cup, which he was to fill at a certain fountain every morning at the hour of five precisely, with the observance of an enjoined form of words. Very shortly his affairs, as his health, began decidedly to improve, and he was glad to reward his fair physician further, when she frankly confessed that she had given him no patent quassia-cup at all, that the simple charm consisted in his having been obliged to obey better nature's law so aptly conveyed in the familiar couplet—

> "Early to bed, and early to rise,
> Makes a man healthy, wealthy, and wise."

But how sadly one wanders. I would observe now, that the aged, dry, in-calf cows are in the yard, fed on oat-straw and a few sliced swedes, being turned out, weather permitting, daily, for a few hours on a barer pasture than is allowed the heifers. All cows should meet their calving well fleshed, as the milking is a considerable drain upon their constitution. An old cow does not, however, require such nourishing food as the heifer during the months of gestation, inasmuch as she has not the double strain upon her system of having to grow herself as well as to sustain the "second principle of life" within. For the same reason, unless the defect be made up by the feeding, the droppings of a young animal are less valuable as manure than those of the full grown, so much of the phosphates occurring in the food being internally consumed by the young one in the formation of its own bone. To the tyro be it whispered, that with a view to the development of a growing

young one's frame, you must give him a quantity of oatmeal and bran; with a view to fat, give barley-meal.

But to extend our visit to the next meadow where the ewes in-lamb are staying. Why, there's one lame; now that's careless of the shepherd. She cannot have had her hoof trimmed closely when first put to the ram, as were my orders, and some sand or dirt has worked up underneath. The part will gather if neglected, but then see the danger of turning her at this late period to dress the foot. The only chance is for two to catch her, so that while one holds her, the other can lift the hoof and trim it. But after all that is not half a job; and even so, unless of a very tame sort, she will struggle perilously.

I shall just wig my shepherd for this. He is in the next field there, where the fattening sheep are penned upon turnips. They are all well, for they all turn to notice as I canter up. One or two have been scouring, from acidity of the stomach probably, or the frost upon the leaves, but it's now stopped. Here he has been before me, and has administered a spoonful each in water of carbonate of soda and ginger, which we find most successful treatment usually.

But I must here pull up and condense what counsel I have to give respecting the farming operations of February into a sedimentary shape that reminds one of that invariable ornament of a college "wine," the sponge cake. If the upper matter be found as worthless in the one instance

as the other, I would recommend you to do as we used to do in—

> "Those happy days,
> The days when we were young."

That is pare off and chew the bottom. Well then you will continue your attention to your stock as during the last month. An animal well fed will ripen a year sooner. Sheep fatten on cut turnips and hay quicker than on whole turnips and hay with corn. Lambing ewes will require constant care; above all things avoid a wet yard for them. To stimulate laying, give your hens oats fried in dripping. About half the winter supply of hay, roots, &c., will now have been consumed; you can, therefore judge and provide with regard to your remaining stores. Sow vetches, beans, peas, oats, and Talavera wheat; manure and dig hop grounds; sow saintfoin. New hedges should be set about, but do not top the quicks until the next spring. Lay in stock of seeds; purchase and haul manures; meadows begin to exhibit the benefit of their winter clothing; pare grass lands, with a view to burning next month; build walls; form ponds; plash hedges —Good bye.

March.—

> "To arms, to arms, ye brave!
> Th' avenging share in sheath,
> March on! March on!
> All hearts resolved——"

to make up the terrible arrears of the last sad wet month, when, even amidst the light loams, it has

been rarely possible to turn a stolen furrow, while the clays have been simply inaccessible; this being the latest period at which beans, peas, and vetches should be sown, there is no time to lose. There are some surviving breadths, too, intended for barley and oats in the early counties, whereas, in other districts the native mind will consider it to have been hitherto full soon for the former grain. The sowing of all crops depends much on local circumstances and climate. It is good practice, however, to have both in the ground as soon as soil and weather allow. The grain of the early sown is far plumper and better filled than the late sown; and the straw is stouter to stand up against the weight of the swelling ear.

There should be no delay in top-dressing such wheat as requires a dose. An excellent application is one cwt. of nitrate of soda, mixed with two cwts. of salt. But the various manufacturers supply special and approved manures for the purpose; as you may learn from weekly advertisements in the agricultural journals.

To the lucerne, which will now be springing fast, dispense gypsum (one-and-a-half cwt. per acre), as well as to red clover, and that inestimable plant, saintfoin. By the dark stains upon the meadows you will discover the existence of the detrimental springs, so as to mark out your draining plan.

Hempseed it is now the month to sow; and flax, in an adhesive loamy soil, manured in autumn with well rotted dung—a crop which, if well tended, will delight its owner, not only by the sweet heaven-blue tint of its delicate flower, but by the abundance

of its produce, and the fine condition home-grown linseed puts the cattle in, so vastly superior to what the too commonly adulterated oilcakes effect. Manure of such quality as your boxes will then yield will fully counteract (with a grand margin) the exhaustion this crop is considered to bring about, while the stems will fetch on an average 5*l.* per ton, the only difficulty being the distance of the market, unless with your neighbour's help you can load a truck. On "clover-sick" land put trefoil or beans as a change. Clover should only come once in the twelve years on the same ground. A good deal of this *clover sickness*, I am bound to remark, is due to the fact of the farmer often using his own seed, which has not been duly ripened and properly harvested according to the rules of those whose special business it is to supply seed. A heavy dressing of superphosphate, in which all pod-bearing (leguminous) plants rejoice, would generally restore to the soil those essential elements, the defect of which is the alleged cause of this disorder. Get the stones and rubbish picked off the young clovers and meadows to be mown. Prepare potato ground, to plant at the end of the month. New ground, where a coppice has been grubbed up or a fence cleared, delights this root, and saves the crop to a great extent from disease. Select, if you can, land on a slope, where the water will not lodge.

Old thatch has been used as manure with great success in securing a sound and abundant yield, probably for the sole reason that it lightens the soil, and ensures quick drainage. In a heavy, wet soil, the

crop is often fine and abundant, but scarcely ever palatable. The root becomes "waxy," whereas in light soils it forms more starch, and is rendered "mealy." "If cut sets are employed, and an early produce is desirable, it may be useful to know that those furthest from the point by which the tuber is attached to the stem, are always the first to vegetate. Sets cut from the middle of the tubers are the next in earliness, and those nearest the stem end, the most tardy in sprouting. Earliness of produce is promoted by placing the sets with the eyes upwards, and largeness of size in the sets promotes the same object as well as increases the produce." A good plan to save seed is to have "the crown about the size of a walnut cut off every sound potato" used in the house. "The eyes in these small pieces cut off as long ago as three months, look quite fresh and well, and are pushing like those in the whole potatoes." (See "Johnson on the Potato," Henry G. Bohn.) The best manure is rich stable dung, which, however, some like to mix with yellow moss or potato haulm. The use of this last material reminds us that the best manure for apple trees, is the refuse of the cider mill. Large crops of potatoes are grown from a lining of oak leaves in the furrow.

To return from our digression, March is the month for hop-planting, and for cutting alders.

You can begin now to feed your water meadows, but be careful to note the progress of the sheep, since, although they lay on meat more speedily as rot comes on (this fact the great Bakewell always took advantage of), there is a point at which you must sell,

month also, when it will require to be singled out to six or eight inch spaces; as pasture will be ready for stocking early in the month, and ready for cutting all the summer. You must keenly watch the growth of the grasslands and stock accordingly.

If the season be genial, the pastures frequently will grow with such rapidity as to lose a portion of their nutritive value. In that case crowd on stock—bullocks first, sheep next, and then horses, at distinct times, and eat it clean down. It is surprising to note how rapidly animals put on flesh this month, there being in the bite just enough succulency and consistency combined to constitute a most nutritious food that does not purge, as the too fresh May growth did. Keep an extra field shut up for hay, so that, in case the pastures fail, you may have it to turn your stock into; or all your previous care and kind treatment will be worse than lost, for condition runs back at once, and will not readily come again a second time.

In wet weather pull up thistles, or spud them deeply. If there be no rooks about to do it for you, keep the droppings of the animals upon the pastures spread daily. Weed your young fences carefully, but "avoid clipping them, which only creates a close surface of feeble shoots, that in the end becomes so thick as to exclude light and air from the central stems, and occasions their languishing and death."

When an unoccupied day presents, quarry stone to mend the farm roads, and fill the drains where you may find it advisable to tap a damp spot. But

beware of overdraining your pastures. There has been far too much of that done.

July.—"Come in out of the wet, as the shark said to the bathing sailor," might be adopted for the motto of this variable month. There is a grand, rich growth both on pasture and cornland towards the close of June, which July too often does its best by dint of storm or scorching heat to daunt and dim. Only let it survive the stern discipline of the month when the sun enters Leo, and the agricultural interest may congratulate itself upon abundant keep for winter time and autumn. The "hay month" the Saxons, we learn, were wont to designate July, probably on the *lucus à non lucendo* theory, for, if bad, mouldy stacks be made, their existence will usually be found to have commenced between sweet June and ruddy August. "Hay monat" or the hay month was their term—one which they subsequently changed to "mead monat," "from the appearance presented by the fields, which at this season are covered with beautiful flowers," rather, we should conjecture, from the bright verdure of the new blades of the aftermath, when they came to know, as we do by experience, that it is wiser to mow in June than during the reign of the dog-days and St. Swithin.

If we have of inevitable necessity fed our meadows late, we should prefer entrusting our mow to the mercies of August rather than of July. Corroborative evidence in our favour is the fact that these same worthy Saxons found fit to change the name of

June to "sere monat," or dry month, from "weyd monat," or meadow month, which they had in the first instance christened it, "because the beasts did then *weyd*, or feed in the meadows." Clearly, then, the name was altered when taught by experience. These worthies adopted as their system the shutting up their grass a little sooner and hiring their gang of painted mowers at a season when the weather was as favourable to the drying of the severed swathe as to the preservation of the tints upon the person of the ancient British labourer.

Independently of the determined sulky continuance of heavy wet that this month too usually indulges in, it has a playful way of introducing also a number of unexpected occasionally disastrous thunderstorms, ever too prone to lay the forward wheat, and not seldom destructive of animal life. The intense heat of the dog-days, withdrawing painfully from circulation the moisture of the earth no less than the substance of the brooks, overloads high air with a hoarded accumulation of cloud, which the speculative electric fluid gradually fills, to precipitate it ultimately with too fatal effect upon man, grain, and beast, the vegetable and animal economy at large; not to mention the ragged ice-lumps they delight to pitch upon the greenhouse and skylight. This month the bright red cranberry in the hollows of the mountain ridge affords a sort of harvest to the neighbouring poor, who gather them together with the purple whinberry (more common in woods), for sale, to gratify, in combination with clouted cream, the luxurious palate of the rich, while it affords a

small store, as "extra time" does upon the farm, towards the cottage rent, a few creature comforts, and inevitable extras of doctor's bill, &c. Mushrooms spring up, too, on the dark rings where the fairies dance, more delicious far than any grown by dint of heated house and gardener's care. Be careful, however, that ye gather not some poisonous fungus by mistake.

"What next?" as the tadpole said when he dropped his tail; why, that he forms this month most excellent and abundant feed for the jacketed ducks and trousered geese, that the housewife begins now to travel a few hours daily on their own account along the orchard and meadow.

Poultry now earnestly moult, it being providentially determined that they should do so when seeds and berries are abundant, and they have sufficient heat to maintain in undress the due circulation of their venous fluid. Domesticated fowl however, whether or not they consider themselves to set the fashions to the aborigines, and that the farm-yard is the Paris of the hedgerow, moult somewhat sooner than the wild birds.

The peas will soon be ready to harvest; mow and cut them with hook and crook into bundles; leave them to dry, daily turning them till fit to carry. Rarest of fodder for your flock is the pea-haulm, it being "richer in oil and albuminous or flesh forming matters than the straw of the cereals."

The winter-sown beans will be ripe by the end of July. Mr. Mechi speaks highly of their use as fodder, cut green in full pod. It is a question

whether this be not a wasteful practice, however, as the chopped bean-stalk steamed with bean-meal must surely go further than the unripe crop mown. The comparative expense of harvesting would be a trifle. Horse-hoe for the last time the carrot and parsnip rows. Single any plants left double by means of children, and pull up young plants which have appeared, for carrot-seed sown in April will keep germinating through May and June. Horse-hoe the mangold-wurzel at intervals this month, as also the turnips. Hoe the rape as soon as it is high enough not to be covered by the operation, then set it out as turnips, only, instead of singling, leave two or three plants together; continue sowing it throughout the month. Pull flax before the bolls have ripened. Sow autumn turnips on the flax and rye stubbles (Chivas's of Chester, is an excellent kind).

On the pastures you will have to thin the stock where the subsoil is gravelly, but a damp, cool soil will carry as many as during last month. The fat beasts and sheep should now be ready for the market. Avoid stocking the aftermath until fairly grown. Put a coating of manure as soon as you conveniently can upon the hayfields from which a crop has been carried; the practice of manuring land after every crop is an excellent one, which may be expected ultimately to carry the day. Keep the ewes well this month. Remove the boar from the sows until the beginning of November. Wean the lambs. By the commencement of the month at latest, your barns, waggons, tarpaulins, should be ready for use.

Repair and make new hurdles. Buy wethers for winter fattening. Look to shape, size, quality of wool, and flesh. Between hay and corn harvest the young farmer has an excellent opportunity of making a tour to observe the practice and study the stock of other countries, and get acquainted with men of authority in agriculture; there are landlords in England who will pay the expenses of a tenant travelling with that view, so well do they know the ultimate benefit such a course must bring to themselves, the tenant, and so perhaps eventually to the noble science of agriculture itself.

In order to procure manure rapidly, as many animals as possible should now be soiled in the yards.

On hot days visit frequently the grazing cattle and sheep, and take care that they have convenient shade and water, the want of which causes much trespass and breakage of fences, when, if a corn field intervene, the damage may be frightful.

August.—How well I remember, during one's Oxford days, it seems but as yesterday, that no sight in nature used to delight one more than that rich brown August tint upon a Highland moor, which T. M. Richardson so gloriously manages to depict, with doubtless as little thought of rural economy as troubled us then. How differently, with the decline of years, one appreciates this mellow period; the grand Argyleshire kine one looks on now, not merely as a picturesque appendage to the landscape, but as a shapely framework for the development of prime

Christmas beef. A charming month is August yet; but it is the golden hue of the heavily weighted corn-stem that now detains the eye. Harvest is upon us with its anxious period, the cares of which however are so greatly lightened, by the introduction of the reaping-machine. The various sorts are so simple now, so successful, and so reasonably priced, that I most strongly recommend you, my young friend, to provide yourself with one at once, if you have hitherto delayed doing so. You can have no notion of the relief it will be to you, of its superiority in every respect to the harvest gang, Irish or otherwise, of years gone by; it eateth not, it sleepeth not, it is not mutinous for more drink, and, that too, when minutes are money; it varieth not its level stroke, but steadily, swiftly, irresistibly it steals on in industrious career, leaving behind it a beautifully even, low-cut stubble, while it keeps the binders busy as they can be, and, therefore, the happier. Our plan is to let the corn out at 4s. to 4s 6d. an acre to the regular farm-men (lending them the machine and horses, the chief value of which is that it saves so much time at a valuable season), in consideration of which they bind the wheat and set it in shocks upon the field all ready to be carried. The plan adopted by a shrewd friend of ours, is to let twenty acres apiece to each of his best workmen at 7s. an acre, he lending them his machine, waggons, and drivers; he also rakes the stubble, they having cut, loaded, and stacked the sheaves. Each man thus assumes temporarily the responsibility of a sub-bailiff, learning thereby the value of implicit obedience to

authority by the time he joins the ranks again. They provide their own assistants and work their own hours, the smartest of them with their families, making as much as 35s. a week for the period of harvest, while the master gets his work done splendidly in advance.

Then what of the stubbles? Why he, happy man, just moves up his steam engine to a narrow gateway in the fence, sets his anchors around the field, and smashes up with a scarifier some twelve acres a day, however hard the soil be, preparing thereby an early seed-bed for a stolen crop, a plan that has enabled him, to add considerably to the number of his flock.

This smashing up and exposure by subsequent harrowing to the remorseless sunshine, the vagrant couch cannot stand at all. It gathers in its claws and is soon extinct, for the sprays are but youthful at this season on the stubble. Tempted by a shower, all seeds of annual weeds will hop into existence, as quickly to hop out under acrimonious treatment of the harrow tines; and so the soil is thoroughly cleaned and devoted wholly to the sustenance of the turnip, coleseed, mustard, rye, or any other intercalary crop that may be intruded between the lines of regular succession. Not having the advantage of steam machinery, our occupation being hilly and rocky and irregular, we copy it so far as we can by setting on three pairs of horses, each before one of Woolfe's paring ploughs, from which we take off all the accumulated apparatus but the share. On a loamy soil they will work at once after the grain is cleared, and well. Clay requires a shower to moisten

it first or the steel will not bite. They will traverse 1½ to 2 acres each a day, leaving all weeds upon the surface and cutting some three inches deep. This cleaned and pulverized mould is obviously of much value, whether you plant in it late turnips, or turn it under by a subsequent ploughing, the depth of stirred soil being so considerably increased, as by the common plan of one plough following down the furrow of another. What a contrast to this is the method of a few years since, when the old-fashioned farmer was wont to calculate upon the keep of a grassy stubble for his stock as he might upon a meadow aftermath.

After a couple of years persevering treatment of this sort, the foulest farm may be got clean, which would never be the case if couch got cut up into multiplied sets by ploughing, as was the ancient practice. By cleaning the stubble well in autumn there is a great saving of labour during the busy spring months, besides that to work a light soil to its proper fineness of tilth wholly during the spring is found to deprive the land of its due moisture, and so render it unfavourable to the growth of the turnip-braid. This theory gains great support from the almost universal complaint of the Suffolk light-soil farmer against a clause usually entered in the leases of that county, which obliges him to work his land five times over, even though "it be a blowing sand," when one turning over is found by unfettered tenants ample, and productive of crops, the very semblance of which cannot, under the other system, be attained.

To return, however. Having cut your corn, if you have not the rare and exceeding advantage of buildings placed centrally upon your farm, choose the best spot convenient to that and other corn-fields, not forgetting water (a spring if possible), near which build your stacks. You will save much time in the hauling, while you avoid oftentimes waste that is incurred by driving along lanes and roads.

When occasion demands, you can have a portable threshing machine brought to the spot, and the straw is convenient to be made into manure by sheep and oxen at a very little expense of rough-shedding, which, however, you can have made to take to pieces, and shift annually with your harvest ground. It is a great thing to make your manure adjacent to the land for which it is intended. To effect this you must consider much, if your homestead be not central to your holding. Ours, unfortunately, is at one end, so that I speak from sad experience. Do not allow your crops to remain standing until dead-ripe, for if you do you will scarcely be able to cut them fast enough, and must lose much grain; besides that, if wet overtakes you, it will the sooner sprout. Barley, however, requires to be fully ripe, or it will be of less value for malting purposes. Oats will shed sadly with the first heavy wind, if left uncut too long. The Belgian farmers are very fond of cutting many crops with the sap in them, which will rise and ripen the head when connection with the root has been severed. Our millers prefer corn that has been so dealt with, for the skin is thinner, and the produce of fine flour greater. Grain that is

stacked upon out-door framework may be carried sooner than that which is housed in barns, for it will be subjected to a better circulation of wind and sunny air. *Trifolium incarnatum* is an uncertain plant, suffering terribly some years from the assault of slugs and snails. It is a grand crop that comes heavily for one grazing and two cuttings, if it survive the perils of its infancy. This is the time to sow it upon the wheat stubble, which cannot be *too hard*, only requiring to be scratched over with harrows or a light scarifier, so that the seed can be lightly dusted over.

Deeper tillage will disappoint your hopes. You will now find your pastures begin to decline, but the aftermaths hitherto spared will afford a long fattening bite. To them transfer your draft ewes, and store beasts. Take care that your calves do not get stunted now, as early neglect of a youngster can never be repaired. To procure early fat lambs the ram must be turned amongst the ewes this month. Be very careful what you use, as a bad coarse sheep may spoil your flock. Do not hesitate to pay a good figure for a first-class shearling, or more (according to the size of your flock), carefully selected from the pens of some eminent breeder who devotes himself to their rearing.

The sows should farrow now, so that the piglings can grow to a fair size before the cold weather comes to nip them. Before the leaves fall send forth a gang to cut and gather all the fern, thick hedge-row clippings, the weeds and clearing of watercourses, &c, any sort, in fact, of stuff that can be turned into

manure in the yards. The burning of headlands, and every attainable rough spot will, of course, continue as last month. Remember to haul in the ash-heap, as it is ready, before rain fall. It should be absorbent and thirsty for the juices of the dung heap to do the good you will expect of it.

This is the best month to sow renovating grass mixtures upon your weak pastures. Harrow well first, lengthwise and across again; then chain or bush-harrow the seeds in, and if you give them further a taste of artificial manure to raise their spirits, it may be well,

The horse-hoeing of your turnips must proceed early this month, if not all finished before, on as hot days as possible, so that the weedlings may be torrefied; but there is a tide in the affairs of turnips that you must be careful to watch.

You can scarcely horse-hoe too early. You may easily horse-hoe too late, and thereby prevent the crop attaining a fine growth. Pull up the seeding carrots and mangold-wurzel for your porcine pets. Many farmers stuff a thick bed of bushes into every feeding-box, after the fashion of the heather couch that Waverley reposed on. This keeps the litter dry, under calves especially. The bottom should, of course, be paved and strewn with absorbent matter; but it is astonishing the comfort this elastic layer yields the reclining animal.

If the surface be hard and rain imminent, it is well to cart out as soon as possible as much dressing as you can spare for your mown meadows. There is a mysterious process by which the

scorched earth avails itself for its advantage at once of manure hauled on to it even when moisture is wanting. Obviously, however, we should watch for a time when rain may be shortly expected, so as at once to guard against the evil of evaporation under incitement of the sun's rays, as well as to secure the washing in of its entire richness for the lowest rootlets' enjoyment. You will find that you have a far better and more abundant crop of wheat after clover when the layer was mucked directly after the mowing. The straw has then had time to decay and become friable, besides the benefit worms will have done you by pulling much under to decompose and blend with the soil.

It is time to turn the stream on to the water-meadows now, allowing it to wander at its own sweet will, until a goodly swathe has arisen again, under fostering influence of the gentle current. Pick what stones you can for the repair of the roads, from shrunken streams and other sources. Sweep out the rain-shoots around the buildings, lavishly limewash, have the tanks cleaned out, and repair generally all defects in the covering, machinery, stalls, pavement, &c., that the last winter betrayed to your notice.

September.—Up to this period, the incidents of agriculture have been much the same as during the later August weeks. You have now to be reminded that it is not for you to calculate that the existing long keep upon the meadows will, as the "great king, live for ever," but that there is a nipping influence at the grass roots, which will steadily arrest the growth of

the blade, so as ere long to disappoint even the research of the close cropping horse. Autumnal cultivation by dint of steam where the opportunity allows, but if not thereby, at least by dint of a well-fed equine force that is never allowed an idle day, being proportionately paid in victuals, has been, or ought to have been, progressing fast before the torrents came. Many an acre's breadth there should be of weed seedlings hatched before their time, by this process of modern farming, that would give one leaf a-piece to be allowed to fly away with the collecting swallows, but my young friend, don't allow it for a moment; have at them the first scorching day (to hoe in damp weather is simply work thrown away), and your land for the next crop will be accordingly clean. The farmer as Mr. Mechi so truly reiterates, must not grow weeds if he cares for cereal produce. The sow that is good to rear ten piglings well, would simply starve the thirteenth; always at every feed an unlucky intrusion. The late sown turnips should give plenty of work to the hoers now, but this year from some strange cause, notwithstanding the lovely luxuriance of the swede and mangold crops, the white turnip, late sown, is a comparative failure. Certain it is that the period of the seed being committed to the soil, was tormentingly hot, and the fly, or rather flea, throve in active aggravating force.

There is every promise, however, of abundant root crops; so much so, that store stock will be most assuredly at a topping premium before winter. The cleanest stubbles you may scratch now with harrows

for the reception of *Trifolium incarnatum* seed : mind do no more than *scratch* them, just sufficiently to have dust to cover the seed, or the crop will fail ; so hard a subsoil does it delight in. After sowing, at once roll down as hard as possible, and, if you please, give just a sprinkling of guano or superphosphate to raise its spirits ; it comes very early in the spring, and allows of three cuttings. It is much less dropsical than vetches, and goes, consequently, much further in the fold yard. It is, however, during its early youth, sadly at the mercy of the villain slug, whose slimy clothing, correspondent to the blubber of the cetaceous tribes, enables him to stand the cold far better than his mailed relative, the snail. A good dusting of quicklime is the best preventive of this foreigner's incursion. Give the young clovers a good dressing of muck, which they will well pay for in a reduplicated crop next year. They should have been rolled down tight—you cannot roll this plant too much—as soon after barley harvest as there was sufficient moisture in the ground to ensure its closing up its pores, and you must choose dry weather to haul on the manure, lest the wheels cut the texture up. A great mistake it is to feed young clovers down before winter, because as the excuse is, the frost will, if your sheep don't ; every tooth-bite of a leaf destroys a rootlet, which is not the case under the withering influence of the frost. This seals the juices temporarily up, but it does not destroy the bottle. We prefer manuring the young clover to hauling out for the subsequent wheat crop, as is usually the practice.

Rather lime the clover fallow: you do it with this beneficial consequence, that the wheat enjoys a triple compound. The lime reduces to nutritious aliment all that were otherwise indigestible in the accumulated clover root mass; it awakes also any possible dormant element of the muck that was supplied to the preceding crop, and it greatly strengthens the straw. For spring keep sow now your rye, winter vetches, tares, and with the vetches, two pecks per acre of winter oats for this confiding plant to cling to; it is otherwise apt to lodge and rot upon the ground. Some lay down permanent pastures this month, where the land has been well cleared in summer fallow; on the whole, however, I see that Mr. Sutton, in his essay, prefers spring sowing, owing to the tenderness of some of the clovers in the now so scientifically prepared mixtures. In old time, when home-made hayloft seeds were all the land got, one looked to having hay off the next year. It is true enough however, that the system of sowing such seed is apt to introduce much filth, such as couch, docks, &c., and is not comparable to the plan of buying fitly compounded ingredients from the seedsman, who makes it his study to ripen them properly, in clean, separate crops.

The ram will be now generally turned to the ewe flock, for which reserve good keep. Their being freshened, but not fattened, at this period will tell at spring time in an additional quantity of lambs.

The seeds you use, one ought to have mentioned above, you should obtain from a colder climate and a different soil; the produce will improve and yield a

better sample under the more genial circumstances of its nurture. Sow about one or two inches in depth. It is a safe plan to steep your seed, though many farmers despise it, either in a solution of blue vitriol and water, or salt and lime. Early foals should be weaned and well kept with good shelter. Good plentiful keep is half the battle to a youngster. Have your flock dipped all round on a warm day. This is the time when the captain should be upon the paddle-box, and see that, while the operation is thoroughly performed so as to kill the vermin throughout the fleece, there is due precaution taken to prevent any of the liquor being swallowed owing to the animal's struggling. They should be turned out to dry in a yard where they have no access to any grass. We have known a flock half-poisoned by being sent to graze on a paddock which another lot had lately ranged with dripping coats. Greatly will it repay you to have this essential operation duly and carefully done. The unchecked growth of ticks in the wool gives sad torture to the ewe in spring, and most certainly checks the lamb's thriving, as we experienced to our sorrow one season when we were fresh at farming. Nothing can thrive under irritation of that persecuting parasite. Many prefer to plant their potato crop towards the end of this month, and some push in their wheat; which however, is not required under ordinary circumstances of locality and climate.

The oak and beech mast now so abundantly strew the ground, that it will more than ordinarily repay the occupant of forest land to turn his pigs out

amidst the trees. Tenpence ahead per week was what it cost ourselves two years ago to feed our porcine retinue during the late autumnal months. The way we did it was this. We bought a quantity of damaged Indian corn at 2*s.* 6*d.* per bushel. Of this there were boiled eight bushels to a load of swedes, the residuum being deposited in a vat, from which was doled out the morning and evening repast of each lot as they returned from their diurnal woodland ramble. And now, with the finish of our paper, comes the reminder that it is with most a favourite period to take stock. Balance carefully your farm accounts, taking care to put, or have put for you by a competent valuer, a fair average value, rather under than over, on your stock, crops, &c., and charging about 7 per cent. for wear and tear on money laid out in implements, &c.; and so, to September, adieu.

October.—October, the home-brewed October, how seldom do we find you! The time is out of date when men brewed so many months, if not years, in advance. And with the disappearance of the rich mellow, nut-brown drink one used to quaff as a lad from those ancestral long glasses, has disappeared it seems, the walking up of the stubble with investigating pointer. With the introduction of the railway, telegraph, &c., there hath been much of change, save only in one respect, that this month continues still the month of "rural plenty, affording an opportunity both to men and animals, for laying in a large stock of health, to enable them to support the severity of

the coming winter." It is now the season for storing the potato and carrot crop. Let the weather for taking up be dry, and mind that the labourer forks deeply enough to avoid snapping off the carrot fang, for the root once broken will not keep half as well. Their peculiar system must now reward those who grow their potatoes simply, as in America, by strewing a layer of straw upon the seed to find at harvest time a sprawling brood. There is, however, a sort of ribbed iron double-mould-board plough, that much facilitates the raising of this esculent, passing under the root bed, letting through its bars the soil, and leaving the tubers on the top, to be gathered by the attendant gang of labourers' wives and children. Store the crop dry behind a north wall, and mould it over with earth. Don't think of strewing it in the granary with simply a straw coverlet, a plan that encourages an insidious growth, to the detriment for boiling of the vegetable, while it afflicts it with a vile mildewy taste.

But it is a busy month for the storing of all sorts of roots. The swedes and mangold-wurzel that you draw for homestead use are best kept, either thrown in dry, the crowns twisted off or cut high, with their rootage intact, and clinging soil, into the bays of a spare barn, or built up between rows of hurdles about a couple of yards apart, lined with fresh straw, and thatched, and then earthed over smooth as a beaver's hut; holes stuffed with a wisp of twisted straw being left in the top, at intervals of five to six yards, for ventilation by the escape of accumulated gas. Roots thus carefully stored under shelter of a north fence

upon an island so to speak (a trench with outlet to conduct the rainfall off having been cut six inches deep around the line of hurdles), will keep almost until the early roots come in again, but always into July and August for the forcing of prize stock. Only, having stored, never disturb. Leave in its entombment the mass of soil-freighted interwoven white fibrous growth, without disturbance of any sort. Take only from one end as you require them, directly covering up the wound, for only once by unbuilding let in the outer air, and the damp, downy damage of decay is inevitable as a coating the third day upon your cardigan of opened claret. Pack the carrot crop in sand, well dried, ready in a dark cellar. Under straw it will soon vegetate and rot. It will be time, however, to begin using one sort—that is, the white, or autumn turnips—in the way of sheepfolding, not forgetting an addition of sweet hay chaff, oil-cake, and corn, to warm the stomach and prevent mischief from frosted grass, or of salt to aid digestion.

Wheat-sowing will be the principal operation of the month. the clover layer should have been limed before turning in, the effect of lime being to stiffen and brighten the straw, while it aids the decomposition of accumulated vegetable matter in the soil, indigestible otherwise by the wheat plant. About once in seven years is a dressing of this material requisite. Roll and press down tight the seed-bed, for the young wheat loves a firm footing, is soon disheartened, and oft-times defunct in spring from neglect of such treatment. This applies, however, to

the bright and loamy soils. A clay one would desire to roll by help of a steam-engine and anchors, so as to avoid all treading; the hoof-pits of horses holding water with deadly effect.

Some of the turnip-land will be ready, the crop having been partially removed, and partially fed off. Towards the end of the month, you should dress your land, and plough in preparation for winter beans.

I have forgotton to mention above, that the land should be somewhat moist for wheat-sowing, but not so much so as to knead under the horses' feet.

You will be tying up your oxen for Christmas beef, and the hogs will have their liberty abridged, with a view to being ripened into flitches for the gaping rustic household. Porkers and picklers will have to be put on sweet food, skim milk and bran if you can provide it, and the reward, we will warrant you, shall be a toothsome morsel.

The teams must be carefully fed and tended, this being the period of their changing their coats; they are comparatively weak, and will rapidly run back in condition, unless great attention be paid them after work.

Look to your fences and water-courses; having trimmed, plant up the weak places of the one, and keep the other clear of accumulation. Sow another succession of winter vetches, having sown some in September for use during next May and June; and if you have overlooked it, as you ought not to have done during the past month, sow rye upon such stubbles as you destine for early sheep-feed. With the fall of the leaf the woodman's axe will awake

again; your supernumerary, or required, timber, you can now have felled. Your wood-stack build convenient to the homestead, for to the farmer the saving of labour is much. Roads, made now, will have a better chance of binding than hitherto; and the landsprings will indicate their whereabouts, by a dark stain, to the drainer. Take advantage of dry weather to haul manure on to the meadow land, in broad wheeled carts, the tire of which will not cut up the sward. Mow and collect stubble of all sorts, gorse, heather, bushes, fern, to strew as the lowermost layer on the fold-yards. It is astonishing how much an elastic bed of this sort helps the dryness of the beasts' out day-lair.

The winter fruits, apples, walnuts, &c., may now be gathered as the weather allows. The former, some carefully pick, then store at once upon shelves, in an airy cool room, free from damp, there to remain until used; others sweat in heaps, so as to extract some of the moisture, and then bury in dry sand.

Filberts and walnuts we find keep sweet and juicy late into the next year, in large earthenware pans, covered over with a slate, in a spare wine-cellar. Fruit trees of all sorts can now be pruned or replaced. In planting, have an especial care for the drainage of the roots. Some almost never-failing peach trees of ours owe, it is thought, their fruitfulness to the care with which a trench was prepared for their planting full of shingle, potsherds, and the like.

November.—There is but little to set forth in the

programme of this suicidal month, as our lively neighbours across the Channel designate November.

The cattle will be brought for the most part into the fold-yards and boxes; littering and feeding them will be the main operations for the men.

To the breeder of good stock a season of incessant delight commences. One is never wearied of wandering from pen to pen and house to house, watching the happy cows, as they chew their cud, comfortably reclining on sweet, clean straw, or reviewing the colt's points as they busily employ themselves with their feed of ground oats, hay, chaff, and pulped roots, or speculating on the respective merits of the soft-coated calves, or attending the busy rattle of the threshing-gear in the barn, as it beats out the grain for market from the straw that is required as fodder, for it is sweeter so provided, than when carted from a rick some time threshed-out by steam machinery. Keep all the stock especially well at this period of change from one sort of food to another, or they will rapidly fall off. During dry weather cart out manure on the meadows with broad-wheeled carts.

It is a good time to level the ant-hills, which, if encountered by the mower in hay-time, are very apt to break the scythe. Admit such cattle and horses as lie out only on the driest pastures. Let the sheep have shelter; in this the wild flocks should be our guide, these you will always find, during bad weather, comfortably reposing under the lee of rock, bush, or bank; whereas we cruelly submit the greater delicacy of our improved breeds too often upon a bare open, to the mercies of a keen winter

blast. Upon turnips, give them a fence of wattled hurdles. Work off any arrear of last month's duties: an arrear which in some seasons, such as this, owing to the weather, is inevitable. Keep clear the water-furrows upon the ploughed land, and push on with any hedging and ditching that may require doing. Fell all kinds of timber not adapted for barking, and cut the willows for hurdle and basket-making. Let the boar run with the sows. Pit the swedes in a long store beside the homestead, for use in the feeding-houses, in earth-covered heaps upon the field, to be fed off. Build dry walls; it is getting late to use mortar for out-door work, rendered rotten and worthless by the frost. Let out the stream upon the water-meadows, and begin to drain the heavy land. Subsoil and dress such ground as you design for plantations. Plant after ploughing deeply. Continue on dry days to store carrots and parsnips. Thin the sheep pastures to their accustomed winter stock, which ought rarely to exceed one sheep per acre. Put the breeding ewes on the bullock pastures. Watch for a mild morning to turn the water on your catch-meadows; keen winds and frosty air being hurtful to the young growth.

December. — Finish ploughing and subsoiling, before the new year. Plough lea for oats. Cart lime and marl, and spread upon the fields. Cart stones for roads and draining: manure to fields: grain to market. Bring home the purchased feeding stuffs. This month and the last are the most convenient season of the year for draining. Keep

ewes and grazing sheep on the pasture through this month. Top dress with composts. Litter yards well. Thrash for straw. Clear old fruit trees of moss and mistletoe; prune in mild weather. Dig and dung. Trench and dig plantations, but plant only in mild weather. The rest as November.

ESTIMATE OF STOCK AND FOOD REQUIRED FOR 100 ACRES.

In forming an estimate of the "stock of different descriptions" required per 100 acres, it is to be remembered that very much depends upon accidental circumstances, the climate, nature, and quality of the soil; the extent of artificial grasses grown, the condition or "heart" of the land, &c. Good treatment of ordinary soil will enable a farmer gradually to double the number of the animals previously fed upon the same ground. Through his famous water-meadows, Mr. Pusey was enabled to quadruple his sheep, while by improved cultivation he doubled the corn crops of the tenant who previously occupied the farm. Twenty acres of his catch-meadows afforded keep for five months, for the wondrous multitude of 400 sheep; while on another meadow of 2 acres he fed to "thriving condition" no less than 73 lambs. So well did Mr. Pusey find these meadows answer, that at last he dispensed altogether with laying any part of his arable farm into clover or seeds. While on a farm of 104 acres, Mr. Littledale of Seacombe maintains no less than 83 milch cows of the large Yorkshire breed, and 15 farm-horses; and on a farm of Lord Leicester's of about 1200 arable acres, 200 pasture, Mr. Hudson keeps the

annual average of 2500 sheep, 150 bullocks, and 36 working horses; there is land of which it takes 4 acres to maintain a cow. While Mr. Dickenson obtains 6 tons of hay from one acre of his Italian rye-grass; and a small field of 3 acres of the same grass, on Mr. Stansfield's estate in the West Riding, yields the entire summer food of 6 work-horses and 5 bulls, besides supplying a fresh bite for the cows twice a day when they are brought in to be milked; on other farms it is hardly a satisfactory crop.

No general rule can therefore be given to the young on this head; a fair average proportion may be stated for a farm where the plain pasture, without aid of artificial grasses, is looked to for summer keep, and for winter, hay with roots, and this I estimate as follows for the Summer:

	Sheep.	Horses.	Cows.
1 acre of very good land will maintain . .	—	—	1 to 1½
Ditto ditto . .	5	—	1
Ditto ditto . .	12	—	—
Ditto ditto . . .	—	1¼	—
1 acre of good average land will maintain .	2 to 3	—	1
Ditto ditto . .	8	—	—
Ditto ditto . .	—	⅔	—
1 acre of poor land will maintain . .	—	—	½
Ditto ditto . .	5	—	—
Ditto ditto . .	—	¼	—

During the Winter each of my cows upon an average consumes daily 16 lbs. hay and 40 lbs. roots. Upon their roots they have a sprinkling of bran,

bean, barley, or oatmeal: sometimes in lieu thereof ¼lb. daily of oilcake.

Upon this keep they average, now February 26, 6 to 7 lbs. of butter each per week, having calved in December, January, and February, although several are far more aged than it is advisable to keep them, being 11 to 12 years of age, one yielding 9lbs. herself. They are besides in prime condition, being half ready for the butcher. They are turned out for some hours daily on a very bare pasture, and have water before them in their stalls.

My horses work hard, and are in excellent condition, upon an allowance for the 24 hours of 11½ lbs. oats, 2 lbs. bran, chaff ⅔ wheat straw to ⅓ hay (28 lbs.). In addition they have 3 or 4 turnip-bulbs daily. The horses are of powerful stamp, standing nearly 16 hands high; two being of the Suffolk breed.

For the winter, a sheep requires about 1 cwt. hay, 1 ton roots, upon the field which it has grazed the summer through.

A calculation founded upon the above estimate or summer and winter keep required for a single animal, will enable the young farmer to combine his stock according to his fancy, some preferring sheep, some cows, and others pigs.

Pigs.—Of this latter class of animal, the number to be kept depends entirely upon the quantity of garden refuse, the extent of dairy convenience, of obtaining grains, the amount of corn and beans allowed, &c. As a rule, one breeding sow to 100

acres, to have two litters a year, will be found sufficient, combined with a due proportion of other stock.

ESTIMATE OF AMOUNT OF MEN, HORSES, OXEN, AND PRINCIPAL IMPLEMENTS REQUIRED UPON A FARM.

	Acres—Mixed, Arable, and Pasture, but mainly Arable.					
	100	150	200	300	500	800*
Carts	2	3	3	4	4	6
Waggons	1	2	3	3	4	6
Liquid-manure cart	1	1	1	1	1	1
Crusher	1	1	1	1	1	2
Iron rollers	1	1	1	1	2	2
Horse-hoe	—	—	1	1	1	1
Ploughs	2	3	3	4	6	9
Double-mould-board plough	1	1	1	1	2	2
Light grass harrow, or chain harrow	1	1	1	1	1	2
Pairs of heavy harrows	1	2	2	2	3	3
Chaff-cutters	1	1	1	1	1	2
Turnip-cutters	1	1	2	2	3	5
Horses	4	6	6	8 or 9	8 or 9	10
Oxen	—	—	—	—	2 teams	4 teams
Reaping-machine	1	1	1	1	1	2
Cultivator and skimmer	1	1	1	1	1	2
Woofe's paring-plough	1	1	1	1	1	2
Huckvale's turnip-thinner	1	1	1	2	2	3
Turnip-drill	1	1	1	1	1	2
Grass-sowing machine	1	1	1	1	1	1
Corn-drill	—	—	1	1	1	1
Hay-tedding machine	1	1	1	1	1	1
Horse-rake	1	1	1	1	1	2
Turnip-scufflers	1	1	2	2	3	5
Winnowing-machine	1	1	1	1	1	1
Oat-crusher	1	1	1	1	1	1
Oilcake-breaker	1	1	1	1	1	1
Thrashing-machine	—	—	—	1	1	1
Weighing-machine	1	1	1	1	1	1

* 600 arable, 200 pasture.

For a farm of 100 acres of mixed husbandry there will be required a ploughman and lad to follow the two teams, the man to clean and feed the horses, when the lad can help in other work; a man to tend the pigs and cattle; a labourer-of-all-work to do hedging, &c., and to help generally: in all 4 hands. An amateur farmer who studies neatness regardless of expense would require another man.

For a farm of 300 acres there are required a shepherd, a cattle-man who shall also attend the chaff-cutter, two ploughmen and two lads for the teams; two men, for general work: in all 8 hands.

For 500 acres there will be required a shepherd, two men to attend cattle and chaff-cutter through the winter, and for whom abundant summer-work may be found on the farm; three men and three lads for the teams; and three men for general work: in all 12 hands. The foregoing number of hands is the usual complement; at times there will be occasion to employ some in addition for job-work.

The due number of hands for the intermediate farms of 150 and 200 acres we take it for granted the young farmer can calculate from the above data.

On the above noticed farm of 800 acres there are employed four men and four lads in attendance on the bullock teams; four men and one boy for the horses; one head shepherd, with two men and a boy to assist him; one man to attend chaff-cutter; one man for the nag-stable and household jobs; two men for hedging and ditching, so as to keep the fences in fair tenantable order; four general labourers; in all

19 hands. The swede-cleaning, &c., is done per acre by occasional hands; and there are extra men employed at present for the draining, levelling of quarries, grubbing of hedgerows, straightening of fences, &c.; and no farm could be better managed than it is.

The force of hands and implements you will notice does not rise in exact proportion to the increased number of acres. Comparatively a small farm requires more hands and machinery than a large one. On a large farm steam and horse power do much that is done by manual labour on a smaller one. The above average of implements in general use is gathered from our own, and the practice of the best farmers, in this a fair undulating country. In a flat country, waggons may be dispensed with, carts with shifting harvest bodies being substituted. Carts answer better in a flat country, being quicker, while two horses in carts some consider to do more than the same two in a waggon. In a hilly country you must have waggons, on account of the necessity of locking the wheels down the steeps. The above estimate may vary, too, with the number of homesteads in the occupation of the farmer.

THE END.

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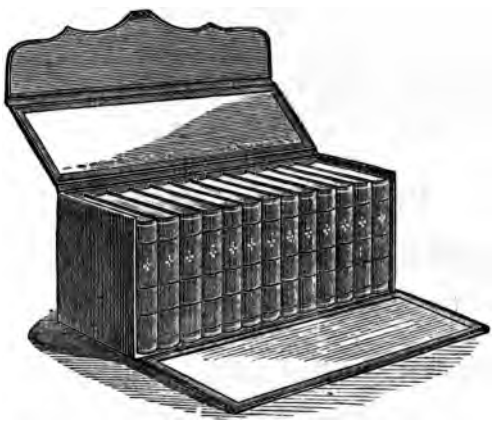

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